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ABSTRACT

In same-age peer-tutoring, the tutor's role carries more status than the tutee's, and assigning the more competent pupil to tutor is more status congruent (equitable) than the reverse; both facets of status should therefore promote achievement and satisfaction in peer tutoring. A series of studies, involving first a simulation then actual tutoring experiments with college students, and finally experiments with Junior High pupils, was conducted to develop and test certain theoretical models built on the above considerations. For college students, role assignment was random within same-sex pairs of partners who were of equal (or unequal) competence. Achievement and attitude assessments followed tutor training and tutoring. Then roles were reversed in half the pairs, before further training and tutoring. For Junior High pupils, roles were reversed in all pairs halfway through a four-week period of daily tutoring. Overall, both performance and satisfaction varied directly with being the tutor and being in a status-congruent relationship. For instance, they declined most in more competent tutors who were made tutees. Turn-taking in peer tutoring thus "optimizes" joint gains by balancing off decrements and increments in rates of gain in learning and satisfaction. (Author)

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FINAL REPORT

on

CLASSROOM ORGANIZATIONAL RESTRUCTURING TO OPTIMIZE SOCIAL-EMOTIONAL AND COGNITIVE GROWTH

National Institute of Education Project No. G-74-0023

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I. GENERAL PURPOSE

The overall objectives of this project were to explore some of the cognitive and affective consequences of same-age peer tutoring on each party to the tutoring relationship. By "cognitive consequences" we had in mind the extent to which relative learning of a particular subject matter was facilitated by the tutoring experience. The notion of "affective consequences" signified for us the extent to which each respective party to the tutoring relationship was satisfied with his or her own specific assigned role in the relationship and harbored favorable attitudes toward the tutoring experience. It was our theoretically-grounded conviction that there are important status implications in any peer-tutoring relationship which have heretofore been neglected, and that these status variables may well influence the outcomes of that relationship.

To elaborate, there are sound reasons for proposing that, since the assigned role of tutor carries more status than that of tutee, this alone may be expected to produce greater learning and satisfaction in tutors than in tutees. Moreover, if the tutor were initially more competent in the relevant subject matter than his or her tutee, such a state of affairs would be more conducive not only to superior learning, but also to greater satisfaction in the dyad, than if the tutor were initially less competent than the tutee. This follows from the fact that the role assignment in the first case was status-congruent or equitable, while the assignment in the second case was status-incongruent or inequitable.

The present project was designed to test these convictions. It should be noted that our objectives, which called for restructuring, temporarily, the relatively centralized organization of the typical classroom into a set of relatively decentralized dyadic tutoring relationships, were intended to supplement, rather than to supplant or substitute for, the normal instructional activities of the classroom.

II. POTENTIAL SIGNIFICANCE FOR SPECIFIC PROBLEMS IN EDUCATION

Assuming, for the moment, that cross-age peer tutoring has greater educational value than same-age, few would question the fact that same-age is administratively and organizationally more practical than its cross-age counterpart. With cross-age tutoring there arises the risk that instructional (perhaps even legal) responsibility for overseeing the students will be diffused when two or more teachers or schools become involved in the overall planning, due partly to the day-to-day logistics of shipping tutors (or tutees) to different classroom or school locations (Bloom, ca. 1976; Gartner, Kohler, & Reissman, 1971), and the day-to-day requirements for coordinating the schedules of different class levels or schools. Cross-age tutoring is also more expensive: Not only may there be travel costs, but it will frequently be necessary to insure that the curriculum material to be used or currently being used with tutees of a particular class level are not so new as to be entirely foreign to, and unavailable to, the tutors.

What of the educational value of cross-age tutoring versus same-age peer tutoring? The views appear to be mixed. For example, Bloom (ca. 1976, p. 33)

while pointing to the organizational complexities of cross-age tutoring, believes that tutees who are immature or less than second grade may need tutors who are 2 to 3 years older, but that same-age tutoring works quite well in the middle grades. Lippitt (1976, p. 158-159) prefers a tutor who is 2 to 4 years older than the tutee, so long as their respective operating grade levels do not overlap. Allen and Feldman (1976, p. 115) report that younger students are most likely to say they like being taught by a student who is 2 to 3 years older. Hartup (1976), on the other hand, viewing the problem from a broader ethological and cross-cultural perspective, concludes that same-age groups have greater adaptive significance for the normally socialized young than do cross-age groups, especially in complex societies, due to the more optimal reward/punishment ratios that are received from same-age than older peers. In the exceptional case of inadequate socialization, he suggests drawing again on the ethological literature, that pairing the poorly adjusted older child with adequately socialized younger children may provide the older child with the necessary optimal reward/punishment ratios that facilitate socialization. Addressing himself to Hartup, Allen (1976, p. 6) maintains that despite the natural preferences of children, cross-age tutoring may still be valid, one reason being that the older child is apt to be more knowledgeable about the relevant subject-matter. Judging from Cloward's Mobilization study (Allen, 1976, p. 228), however, there is "... virtually no correlation between the tutor's intellectual credentials and his effectiveness in tutoring."

We would have to agree with Allen, nevertheless, that there have been far too few studies concerning the consequences of same-age versus cross-age interactions. The empirical data are scant and inconclusive. For instance, Feldman, Devin-Sheehan, and Allen (1976), citing the mixed pattern of results in studies by Linton and by Thomas, conclude that a greater age difference is somewhat better for tutee performance although a closer age range may make the interaction more pleasant. They add, however, that the chronological age differential and the grade differential are normally confounded in such studies, and that studies in which the two are manipulated orthogonally are needed in order to obtain some clear answers.

Complicating this problem greatly are the twin facts that the goals of tutoring and the target persons whom the investigator or change-agent seeks to benefit may vary considerably from one educator or investigator to another (see Devin-Sheehan & Allen, 1976, p. 255-256). Bloom (ca. 1976), for example, views the goal of tutoring as one of enabling the participant to become an effective leader in the classroom; she sees the target person as the under-achieving student, who should then receive tutoring. The principal goals in other tutoring programs appear to be ego development (Strodtbeck, Ronchi, & Hansell, 1976), or social-emotional growth (Lippitt & Lohman, 1965) through the tutoring of younger peers. Some investigators (Henkin, 1975) have a spectrum of goals in mind, such as improved performance in the particular subject-matter, improved attitude toward school, and ego development. They seek for improvements in both the student-teacher as well as the learner.

Allen and Feldman (1976), building on Sarbin's role theory (cf. Sarbin, 1976), and using role terminology primarily, rather than the terminology of effectance, ego, or social-emotional development, view the benefits of cross-age tutoring as providing the older child as tutor with the gratification of

being imitated by the tutee, and indirectly of channeling the tutor's extra-curricular behaviors in more socially acceptable directions. The younger child is said to benefit through having a role model for setting levels of aspiration, and through the increased status deriving from association with an older, hence more prestigeful, child.

Cloward (1976) seems to feel, however, that improvement in educational status of both tutors and tutees should be judged principally in the light of objective measures of improved performance, that attitudinal, aspirational, and other subjective changes are secondary, and that the latter should be taken seriously only if they correlate with achievement in the relevant subject matter.

The problem is further complicated by a methodological issue. Not only are there far more cross-age than same-age tutoring studies, but most of the studies on peer tutoring fail to make explicit use of controls, much less appropriate controls. Where controls are used in a cross-age study, tutors are compared with same-age controls, while tutees likewise are compared with their same-age controls. Where academic performance is the dependent variable, the better studies (cf. Cloward, 1967) will note the amount of change in experimental tutors versus their controls on some norm-referenced or criterion-referenced test. The same is done for experimental versus control tutees. A conclusion often reached from an examination of this "difference of differences" in gains (again, see Cloward, 1967) is that experimental tutors benefitted more than did experimental tutees. Hassinger and Via (1969) used no control students, per se, but compared the improvement shown by high-school tutors as opposed to their fourth- through sixth-grade tutees on standardized reading tests. At best, however, both such comparisons are typically indirect, since they assume the equivalence of an incremental or growth unit in older and in younger students. This can only be determined by having multiple, overlapping age (and grade) levels both of experimental tutors and experimental tutees. There is little reason to think that the same problem does not exist with non-cognitive measures.

This is not to say that cross-age tutoring is without merit, but rather that the question of whether cross-age tutoring is superior to same-age peer tutoring cannot yet be answered. In fact, the question may be incorrectly posed. It is probable that a series of answers will be forthcoming, depending upon the nature of the subject matter and the particular dependent variables being measured and studied. At this juncture it seemed to us that we might do well to proceed with the much simpler question of asking more explictly and directly how same-age tutors fare relative to tutees.

Serious problems of interpretation are always present, of course, in same- as well as in cross-age tutoring, if only some of the students in a classroom are singled out to be tutors or tutees. One such problem is the rival explanation of positive or negative Hawthorne effects. Students who have been singled out to receive tutoring probably view themselves as poor students in need of special help, and as Bloom (ca. 1976) points out, it is doubtful that one successful learning experience will alter this low self-concept. The same may be true of problem students selected to tutor younger children, perhaps coupled with a realistic awareness that the objective of being selected is rehabilitation and reform. On the other hand, asking

only superior students to tutor only low-achieving classmates would seem to be status-enhancing for the tutors but deflating for the tutees. From a scientific and methodological perspective such extreme-group selection necessitates elaborate statistical operations and control groups to deal successfully with the likelihood that the results may well reflect regression toward the mean, and makes it difficult indeed to generalize one's interpretation of the results to students at large.

It seemed critically necessary for us to determine systematically whether the status implications of being placed in the role of tutor or tutee were more than mere hearsay and part of the self-perpetuating folklore to which academicians subscribe. There are good theoretical grounds for assuming that the role of tutor would carry relatively high status among students. Similarly, there are theoretical grounds, as we show below, for assuming that relative difference in pre-tutoring achievement level or competence in a given subject matter is also a pertinent status variable, given that this difference is known in advance by the same-age students. How then should the pairing proceed? Some urge, in the interests of affability, that pairing be a matter of mutual choice, a practice that Devin-Sheehan and Allen (1976) correctly point out creates ill feelings among the excluded (sometimes the majority). A full-fledged test of our thesis would profit from the use of <u>all</u> students in a classroom rather than of self-selected or extreme groups, and from the use of randomization in role assignment.

III. RELEVANT PRIOR RESEARCH

In searching through the same- and cross-age literature, we were interested in locating studies in which comparisons were made between tutors and tutees with regard to the achievement and satisfaction outcomes of their peer-tutoring experience. Below, we summarize virtually all of the same-age studies which, to our knowledge, made some empirical comparisons of this nature. Operationally speaking, the studies in question involved the <u>active</u> transmission of relevant information from one peer to another. We also present a sample of studies in which this act of transmission was from an older to a younger student.

A. SAME-AGE PEER TUTORING

<u>Achievement variables</u>

Table 1 summarizes the variables employed in all of the empirical same-age peer tutoring studies that we located. Of the ten studies cited, only three compared achievement gains of tutors with those of tutees (Performance, Column A).

Mollod (1970) found that for second-grade students, tutors learned more than tutees on one achievement variable (word knowledge), but this was not true for third-grade subjects. For the second-grade subjects, Mollod further reported that being both taught by the teacher and involved in tutoring was more effective in increasing word knowledge relative to controls than was only being taught by the teacher for the same amount of time. Reading comprehension differences were not significant in any comparison.

Table 1. Characteristics of Previous Studies in Same-Age Peer Tutoring[b]

	Performance			Satisfaction: Dyad		Satisfaction: Other			Other Non-Cognitive			Process	Grade Level	Feedback	Freq. Per Week	Duration	Tutor Training: Supervision	Tutor Training: Process	Tutor Training: Content
	A[a]	B	C	A	B	A	B	C	A	B	C								
Anderson & Berger (1975)	No	No	Yes	No	No	No	No	No	No	No	No	No	4	---	1-2	8	---	---	---
Collins & Calavro (1974)	No	No	Yes	No	No	No	No	No	No	No	No	No	8	Yes	daily	12	---	Yes	---
Davis (1968)	No	Yes	No	No	No	No	No	No	No	No	No	No	9	---	daily	30	---	---	---
Heaton (1975)	No	Yes	No	No	No	No	No	No	No	No	No	No	Frsh	Yes	2	2	---	No	No
Keislar & Blumenfeld (1972)	No	Yes	No	No	No	No	No	No	No	No	No	No	Kdg	Yes	daily	1	---		
Oakland & Williams (1975)	No	No	Yes	No	No	No	No	No	No	No	No	No	3,4	Yes	daily	36	daily	Yes	Yes
Richer (1973)	No	No	Yes	No	No	No	No	No	No	No	No	No	1,2	---	---	1	---	---	---
Mollod (1970)	Yes	No	Yes	No	No	No	No	No	No	No	No	No	2,3	Yes	3¼ hrs.	12	---	---	---
Ellis (1971)	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No	No	H.S.	---	---	---	---	---	---
Myers et al. (1965)	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	4-6		3	1	---	Yes	---

[a]"A" indicates comparison between tutors and tutees; "B" indicates comparison among different modes of tutoring; "C" indicates use of non-tutoring controls.

[b]Yes/No designations refer to whether the variable in question was included in the particular study.

Ellis (1971) found that high-school tutees gained more in mathematics than did their tutors, and that both outperformed the non-tutoring controls. He further reported that higher-competence pairs outperformed controls more than did lower-competence pairs.

The third study comparing tutors' to tutees' achievement was by Myers et al. (1965). Here, tutors, tutees, pupils switching tutoring roles halfway through, and those studying alone attempted to memorize English meanings for German nouns. The study ran for three days, at the end of which tutees were found to do better than the others; however, on the delayed recall test, the switch and the study-alone pupils outperformed the tutees, who still outperformed the tutors.

A number of studies compared the effects of different types of tutoring experience (Performance, Column B, Table 1). Davis (1968) compared 'live' dyadic peer tutoring with that solely involving written communication within the dyad. For tutors, the face-to-face situation facilitated achievement gains compared to the control condition, but not so for tutees. Tutor/tutee comparisons were not presented.

Heaton (1975) set up triads involving the following comparisons: tutors did/did not receive behavioral feedback from tutees, were to be awarded tutees' grades versus their own, and had knowledge/no knowledge of grades earned. Tutees achieved better when tutors received behavioral feedback, were awarded tutees' grades, and knew their tutees' grades, than did tutees in the contrasting conditions. Neither tutors' achievement nor comparisons between tutors' and tutees' achievement were presented.

Keislar and Blumenfeld (1972) found that four trained, competent tutors outperformed four untrained, less competent tutees. Linton (1972) incorporated both same-age and cross-age tutoring; the same-age tutoring was less effective than the cross-age in improving tutees' performance in high school mathematics, with the older, more competent tutors succeeding better than the same-age, less competent tutors. The confounding in the above two studies makes them difficult to assess.

Several studies have compared achievement in tutoring with that obtained without tutoring (Performance, Column C, Table 1), or with that presumed to have been obtained had not tutoring taken place. Anderson and Berger (1975) reported that four fourth-grade students' non-English-speaking tutees improved in language skills over a two-month period. Collins and Calavro (1974) reported that nine eighth-grade math students who were underachievers gained in math achievement after several months of peer tutoring. In both of these studies comparisons were neither made with control groups nor with normative expectations of growth in the subject skills.

Oakland and Williams (1975) found no differences between peer tutoring, half peer tutoring and half classroom learning, and all classroom learning, in terms of resultant achievement. Richer (1973) found, in contrast, that tutors (but not tutees) learned more than controls in a brief tutoring study. Mollod (1970), Ellis (1971), and Myers et al. (1965) found peer tutoring superior to controls, although in the latter study, the effect was reversed on a follow-up test.

One interesting divergence from the same-age peer-tutoring paradigm was employed by Rosenbaum (1973). Rather than having the peer teacher instruct the student, he served as a personalized teaching machine or surrogate for the computer role in computer-assisted programmed instruction, noting correct responses and correcting incorrect ones. The success of "Peer-mediated Instruction" on student learning was attributed to both the humanizing of the reinforcements and to the programmed format. While Rosenbaum had the student learners and teachers exchange roles within a given session, only the achievement levels of students while in the learner role were obtained. The progress of these student learners exceeded normative expectations to an impressive degree. We do not know to what extent occupying the role of teacher, alone, had a positive effect on the achivement of those students, much less whether they achieve more while in the teacher, than in the student, role. While Rosenbaum's approach falls outside our operational definition of peer tutoring, it is heartening to find that a same-aged peer can facilitate learning, even though only as a monitor of a classmate's progress through programmed instruction materials. Rosenbaum indicated that student teachers might sometimes attempt to explain things to the learners, if they felt able to do so. But this seems to have been an unsystematic activity that is not integral to Rosenbaum's approach.

Satisfaction variables

Concerning satisfaction or other non-cognitive variables, only Ellis (1971) provides some relevant comparisons. There were no differences between tutoring and control classes on attitudes toward mathematics. Comparisons between tutors' and tutees' attitudes, if made, were not reported.

Summary of same-age studies

In sum, three of these same-age studies showed that being the tutor produced superior achievement to being tutee; three showed the opposite. Three studies showed that being the tutor was superior to control conditions; conversely, controls outperformed tutors in one study, tutees in one study, and equalled tutees in two. The one study on attitudes provided no guidance. Except for the fact that it is possible to do same-age peer tutoring, nothing conclusive can be drawn from these studies.

B. CROSS AGE "PEER" TUTORING

As in the discussion of the research findings on same age peer tutoring, the presentation below summarizes the results of a sample of the empirical cross-age studies that we were able to locate. The summary first examines the findings pertaining to achievement, then satisfaction (with partner and with other circumstances), and other noncognitive variables (such as self-concept).

Achievement variables

A number of the studies summarized in Table 2 examined the effects of cross-age peer tutoring as measured by performance on achievement tests. Of these, only one (Salomon & Achenbach, 1974) compared the achievement of tutors to that of their tutees. The tutoring involved training on

Table 2. Characteristics of Selected Studies in Cross-Age Tutoring[b]

Study	Satisfaction																	Tutor Training	
	Performance			Dyad		Other			Other Non-Cognitive			Process	Tutor	Tutee	Feedback	Freq. Per Week	Duration	Supervision	Process	Content
	A[a]	B	C	A	B	A	B	C	A	B	C									
Carlson (1973)	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	6	4		Daily	6 wks.			
Cloward (1967)	No	No	Yes	No	No	No	No	Yes	No	No	Yes	No	10,11	4,5	No	3	36 wks.	Const.	Yes	Yes
Feldman & Allen (1974)	No	No	No	No	No	No	No	No	No	No	No	Yes	6	3	Const.	1	1 wk.		No	
Feshbach & Devor (1969)	No	Yes	No	No	No	No	No	No	No	No	No	Yes	4 yrs	3 yrs	Const.	1	1 wk.		No	
Mohan (1972)	No	No	Yes	No	No	No	No	Yes	No	No	Yes	No	6,5	3,2	No	2	12 wks.	Weekly		
Garbarino (1975)	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes	6	1		1	1 wk.	Yes		
Duff (1973)	No	No	Yes	No	No	No	No	No	No	No	Yes	No	3,4	1,2			6 wks.			
Conrad (1975, 1976)	No	Yes	No	No	No	No	No	No	No	No	No	Yes	2	1	Varies	1	1 wk.	Yes	IV	
Rust (1970)	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	6	3						
Werth (1968)	No	No	Yes	No	No	No	No	No	No	No	Yes	No	12	9						
Poole (1971)	No	No	Yes	No	No	No	No	No	No	No	Yes	No	8	4-6		3	28 wks.	Const.		
Allen & Feldman (1973)	No	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	11 yrs	8 yrs	Const.	1	1 wk.			
Salomon & Achenbach (1974)	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	adult & 7th	7th & 5th	Const.	2	10 wks.	Const.	Yes	Yes
Morgan & Toy (1970)	No	No	Yes	No	No	No	No	No	No	No	Yes	No	5-12	2-3		3	16 wks.	Const.	Yes	Yes
Sheretz (n.d.)	No	No	Yes	No	No	No	No	No	No	No	Yes	No	8	4-6		3	28 wks.		Yes	Yes

[a]"A" indicates comparison between tutors and tutees; "B" indicates comparison among different modes of tutoring; "C" indicates use of non-tutoring controls.

[b]Yes/No designations refer to whether the variable in question was included in the particular study.

incomplete analogies; the achievement test was the Children's Associative Responding Test (CART). Adults tutored some high- (and low-) associative seventh- and fifth-grade students; some seventh graders also tutored fifth graders. Compared to students not participating, tutoring improved children's scores on the CART; tutor/tutee and grade level differences were not found.

In addition to that of Salomon and Achenbach (1974), a number of studies examined the effects of different modes of tutoring on performance (Performance, Column B, Table 2). Carlson (1973) found that the performance of trained and untrained tutors and that of their tutees did not differ due to the training, nor did they differ when compared to the performance of controls.

Feshbach and Devor (1969) compared the achievement outcomes of tutees as a function of race (black vs. white) and social class (lower vs. middle) in dyads that were internally homogeneous on race and social class. There were no achievement differences among these four groups, either for male or for female tutees. Feshbach (Allen, 1976) mentions a replication with Israeli children, but does not report achievement data.

Garbarino (1975) also compared the effects on achievement of different types of tutoring; in his study, tutors were/were not promised a future extrinsic reward (a movie ticket) for sucess at serving as tutors (if their tutees did well). The tutees of those not promised that reward learned more and made fewer errors than did the tutees in the condition promising extrinsic reward to the tutors, possibly as a result of fewer negative reinforcements (negative evaluative comments) administered by their tutors.

Conrad (1975, 1976) carried out, and replicated, a study with large numbers of second-grade tutors paired with first-grade tutees. He compared high- versus low-competency tutors' achievement, that of their tutees, and the achievement differences attributable to kind of tutor training and style of tutoring, as well as tutor expectancy. Training the tutors elevated tutees' gains; tutoring produced significant gains for all participants. Expectancy had no effect, but in the replication low-achieving tutors gained more than did high-achievement tutors (as could be expected).

Rust (1976) compared the effects on older students' mathematics achievement of being a friend to, or a tutor of, a younger child versus being in in a no-contact condition. The tutor and friend conditions yielded greater gains in tutors' math achievement than did the control conditions.

Salomon and Achenbach (1974), in addition to comparing tutors and tutees, as noted earlier, also compared the achievement of tutees that had been tutored either by adults or one of two types of older students. They found that the mode of tutoring made no difference in the CART scores of the tutees.

Turning now to performance outcomes for students involved in tutoring versus those not involved in tutoring, per se, however otherwise involved, we find a fair number of studies using these types of control. For Carlson (1973), the controls were students randomly selected from the tutor and

tutee classes (6th and 4th grade) who were assigned to study alone. Even compared with this control group, which had no help with the materials, neither the tutors nor the tutees, nor both combined, outperformed the controls. The use of tutoring as a supplement to instruction, with two or four hours of additional study per week over that engaged in by the controls, was found by Cloward (1967) to facilitate achievement. In both studies the high school tutors outperformed their controls, and in one of the studies, the tutees outperformed their controls as well.

A similar pair of studies, by Mohan (1972), involved a comparison between the effects of supplemental tutoring and regular classroom exposure, although data were collected only in the second study. Both the Junior High tutors and their primary grade tutees outperformed their respective counterparts (in mathematics) who received only classroom instruction.

Duff (1974) compared the progress of 3rd- and 4th-grade tutors and of 2nd- and 3rd-grade tutees to that of respective study-alone contols on reading achievement; there were no significant differences. However, Rust (1970) succeeded in having at least the math tutors (as well as older 'friends') learn more than their classroom-instructed-only peers in sixth grade. In contrast, Werth (1968) found that when high school seniors tutored freshmen in reading, it was the tutees rather than the tutors who outperformed their respective controls. For Poole (1971), both 8th-grade tutors and upper-elementary tutees outgained their respective classroom-instructed-only controls in reading and language arts; for mathematics, only the tutors outperformed their controls on achievement. Students involved either in tutoring or in being tutored on incomplete analogies improved their scores over untaught controls, on the CART, in the Salomon and Achenbach (1974) study.

Morgan and Toy (1970) compared high school tutors and elementary school tutees to respective controls and to norms on the standardized math, reading and spelling tests. Performance of tutors, tutees, and tutee controls exceeded the national norms. However, both tutors and tutees outgained their respective controls in all achievement areas.

Sheretz (n.d.) compared tutors' and tutees' gains in math and language areas to those of control junior high and elementary school students. In all of the comparisons, those involved in tutoring or in being tutored outperformed their respective controls; but in some cases the superiority was not statistically significant.

Satisfaction variables

Only two of the selected studies examined satisfaction within the peer tutoring dyad. The Allen and Feldman (1973) study showed that 11-year-old tutors rated their 8-year-old tutees (actually confederates of the experiment) as more intelligent, better performers, and more likeable when those tutees were initially competent than when they were not. The more central measure, tutors' ratings of own enjoyment, was similarly influenced by initial competence of tutee. Salomon and Achenbach (1974) compared the attitudes toward tutoring and toward the tutoring relationship of 7th-grade tutors

of younger children and of 7th-grade tutees of adults; the former reported more positive attitudes.

In addition to the above, three studies examined satisfaction of a more general sort, namely with school and learning. The Cloward (1967) study found no differences in attitude toward school between tutees receiving two or four hours of tutoring per week and their controls, nor between tutors and their controls. While half of Mohan's (1972) results were nonsignificant, he did find that for 5th and 6th graders tutoring 2nd and 3rd graders, both tutors and tutees exceeded their respective controls in rated motivation. However these differences were found only in teachers' ratings of tutor motivation and in peer ratings of tutee motivation. The tutors' self-reported attitudes toward school were also more positive than that of their controls.

Other non-cognitive variables

Several of these studies have examined the self-concept or self-perception as a dependent variable, with varying degrees of success. Carlson (1973), Duff (1974), and Mohan (1972) were unsuccessful at raising the self-concept; however, Poole (1971) found some positive results. The 8th- and 4th-5th-6th grade participants' self-concepts exceeded those of their respective controls after two years of tutoring that involved three periods per week; the results were based on seven months of the second year. In addition, Poole succeeded in showing that social acceptability of participants was higher than that of their controls, a finding presented only as a trend in the Rust (1970) study (which examined tutors' social status versus that of their controls).

Teacher ratings were used in two studies. In the study by Werth (1968), ratings of student interest in English differentiated tutors and tutees from their respective less-interested controls. In the Morgan and Toy (1970) study, teacher ratings of academic ability of tutors and of tutees did not change over the four-month period. The same was true for tutors' and tutees' self-ratings of their academic ability.

Two other variables of interest were attitudes toward school, and attendance, both of which were examined by Cloward (1967). In both change-score and covariance analyses, these variables failed to differentiate either tutees (2 or 4 hours per week), or tutors, from their respective controls.

Finally, for Garbarino (1975), the emotional tone of the one-session study was observed to be warmer in the condition where no extrinsic reward was promised the tutor (for a good performance by the tutee) than when such a reward was promised.

Summary of cross-age studies

There are numerous findings suggesting that cross-age peer tutoring, relative to control conditions, is conducive of increases in achievement; however, in some cases the superiority of the tutoring may (at least partly) be due to more time on task, to regression, or to Hawthorne effects. In

no study reviewed did controls outperform participants in cross-age tutoring; of the ten studies involving controls, eight showed the superiority of either tutors, tutees, or both over controls. Of two studies that varied the training of tutors, one study yielded higher tutee achievement as a function of the training of tutors; the other study did not.

Satisfaction and other non-cognitive variables were examined in a smaller number of studies. We report only two studies examining satisfaction within the dyadic relationship. In one, initially high tutee competence yielded greater tutor satisfaction; in the other, tutors of younger children were more satisfied than their classmates who were tutees of adults. The studies examining more wide-ranging attitudes found mixed results; either no differences or more positive attitudes for tutoring participants. These studies involved such diverse dependent variables as the self-concept, social acceptability, social status, interest, subjective ratings of others' ability, attitude towards school, attendance, and/or warmth.

Cross-age tutoring, as represented by the studies summarized above, can be said, by and large, to facilitate the achievement of tutors and tutees; it does not appear to be detrimental to achievement. Concerning the issue of satisfaction, no definitive statement can be made from the sample of studies that cross-age tutoring will, dependably, result in more positive attitudes. Perhaps this is due, in part, to the fact that not enough studies in this small sample deal with the same type of attitude. A more disturbing possibility is that the search for more global and/or more distal attitudinal outcomes as a function of cross-age tutoring, e.g., attitudes toward the self or attitudes toward school in general, may be in vain. We return to this issue below.

IV. RESEARCH COMPLETED

The grant has resulted in a number of professional presentations, publications, and submissions, which are represented in Appendices A-C. This section summarizes the productions listed below.

1. Rosen, S. (Chair) The status implications of tutoring versus being tutored by peers.
   a. Rosen, S. Status implications of peer-tutoring: Theoretical perspectives.
   b. Schubot, D. Role-play experiment on the effects of peer-tutoring.
   c. Lachterman, T. Some cognitive effects of live peer-tutoring.
   d. Powell, E. R. Some affective consequences of live peer-tutoring.

   Presentations at the meetings of the Southeastern Psychological Association, Atlanta, March 1975.

2. Powell, E. R., & Rosen, S. Some affective and cognitive consequences of same-age peer-tutoring. Paper presented at the meetings of the American Educational Research Association, Washington, D.C., April 1975.

3. Schubot, D. B., Rosen, S., & Powell, E. R. Why it feels better to tutor than be tutored. Paper presented at the meetings of the American Psychological Association, Washington, D.C., September 1976.

4. Rosen, S., Powell, E. R., & Schubot, D. B. Morale and performance of same-age peer tutoring partners as a function of relative status and equity. Paper presented at the meetings of the Southeastern Psychological Association, Hollywood, Florida, May 1977.

5. Rosen, S., Powell, E. R., & Schubot, D. B. Peer-tutoring outcomes as influenced by the equity and type of role assignment. Journal of Educational Psychology, 1977, 69, 3, 244-252. (Appendix B)

6. Rosen, S., Powell, E. R., Schubot, D. B., & Rollins, P. Who tutors whom, matters: Effects of status inequality and injustice. Paper presented at the meetings of the American Psychological Association, San Francisco, August 1977.

7. Rosen, S., Powell, E. R., & Schubot, D. B. To help or be helped: Some consequences of status and status congruence in peer tutoring. Manuscript submitted for publication, 1977. (Appendix A)

8. Rosen, S., Powell, E. R., Schubot, D. B., & Rollins, P. Competence and tutorial role as status variables affecting peer-tutoring outcomes in public school settings. Manuscript submitted for publication, 1977. (Appendix C)

A. PRELIMINARY (SIMULATION) STUDY (Appendix A)

College students were recruited for a simulation study on dyadic peer tutoring in the classroom. The 75 participants were assigned to supposedly tutor (or be tutored by) a same-sex classmate whose knowledge of relevant subject-matter was higher than, equal to, or lower than their own. Following a (simulated) tutoring session with their (imaginary) partner, half of the pairs switched roles for a second session while the others continued on in their same respective roles for that second (simulated) session.

It was anticipated that being in a tutoring relationship with a classmate would be more satisfying to the tutor than to the tutee since the role of tutor carries greater status, and that the relationship would be more satisfying to both if the tutor were initially more, rather than equally or less, knowledgeable than the tutee. Further, reports of anticipated performance were expected to vary directly with the relative status of the assigned role and with the relative competency of the "partner". Analyses of the results, while generally supportive of the thinking entering into the design, clearly fell short of testing the complexity of the role exchange design. Further conceptualization and attention to theory led to the generation of two models, each of which would more fully account for the present, and for future, data.

The first model which was coordinated to the 2 x 3 design of the first session (assigned role x relative competence) assigned differential weights

to relative role status (more to tutor than to tutee) and to degree of equity (most when the tutor was the more competent, least when the tutee was the more competent). The second model took into account changes, if any, in status and equity and was coordinated to the 2 X 2 X 3 design (first role x second role x relative competence of first role tutor). In this more elaborate model greater weight (positive or negative) was given to change than to non-change in status and in degree of equity. Application of the model to the data using a multivariate extension of the method of contrasts, while ex post facto, facilitated interpretation of the findings and provided substantial support for the theoretical models.

B. THE COLLEGE STUDIES

Our two college studies (Appendix B) were predicated, once again, on our central thesis, which is that the status implications of role assignments, in that special kind of helping relationship known as same-age peer tutoring, carry with them the potential for inviting invidious comparisons and felt inequity and, as a consequence, for affecting the relative performance and morale of the tutoring partners.

In the first study, over 180 volunteers of both sexes (mainly female), enrolled in several upper-division sections of educational psychology, were recruited. The stringent requirements of having intact pairs for the two sessions resulted in substantial attrition; only 43 intact pairs remained. To strengthen our argument, we conducted a replication experiment the following academic quarter with a comparable sample, which yielded 46 additional intact pairs. Statistical analysis failed to reveal any differential subject loss among treatment conditions. Furthermore, since no essential differences in results were obtained between the original and the replication experiment, the two samples are treated here as one.

The paradigm employed was basically the same as in the simulation study, except for the fact that the events, here, were real. After being pretested on course-related material, half of the participants in each class were told that they would be randomly assigned to the role of tutor; the other half to the role of tutee. In one-third of the same-sex pairs, the partners learned that the tutor's pretest competence exceeded the tutee's, a strongly equitable or status-congruent arrangement. In another third, the partners learned that their competencies were equal, and in the remaining third that the tutor's competence was less than the tutee's, arrangements of weak and strong inequity (or status incongruence), respectively. Anticipated performance and attitudes were then solicited in a First Impressions questionnaire. Two sessions followed, each session involving the sequence of tutor training (on course-related material), tutoring, a posttest administered to everyone on relevant session material, and an attitudinal questionnaire which every participant completed. Just prior to the second session, which was to involve new materials, the participants in half of the pairs learned that the two partners would exchange roles for that second session, while those in the remaining pairs learned that each partner would continue on in the same role.

The two theoretical models that were derived, post hoc, in connection with the simulation study, were applied. (The models, as adapted are tabled in Appendix B). One model was coordinated to the "first impressions" that

preceded the first session, and the second, more important model (which is described below), dealt with the changes in the outcomes from the first to the second session.

One theoretically based expectation underlying the change model was that relatively greater changes in performance and satisfaction would occur following a change in role than a continuation of role, the direction of change depending on whether the change, if any, was to the more desirable role of tutor than to the less desirable role of tutee. This dimension of (change in) tutorial status was translated into several numerical values, a more positive value being assigned to a change from tutee to tutor than to continuation as tutor, and a more negative value being assigned to a change from tutor to tutee than to continuation as tutee.

The second theoretically-based expectation underlying this model was that greater changes in the performance and satisfaction of both partners would follow from large changes than from small changes in degree of equity, the direction of change depending on whether the change, if any, in equity status was toward greater or toward less equity. To represent this dimension of (change in) equity status, a more positive value was assigned for production than for maintenance of strong equity (i.e., for a more competent tutee becoming the tutor, than for a more competent tutor continuing to be tutor); a more negative value for production of strong inequity (i.e., for a more competent tutor becoming tutee, than for a less competent tutor continuing as tutor); and an intermediate value of zero for the remaining situations, which involved the weakly inequitable cases where the partners had equal competence.

Finally, the relevant values were added across the two dimensions to generate a set of theoretical weights, which meant, of course, that the more competent tutee who became tutor received the most positive weight, and the more competent tutor who became tutee, the most negative weight. The 12 weights thus generated were applied to all treatment means at once, the tests involving both a multivariate and a univariate application of the method of contrasts. The multivariate contrast was found to be highly significant, in the appropriate direction, as were most of the univariate analyses. Changes in perceived performance, actual performance, and role satisfaction were clearly influenced by changes in assigned role status and degree of (in)equity.

It should be added that application of the other theoretical model, which was intended for use on the "first impressions" data collected prior to the first session failed to produce significant results. Why was the change model more effective? It seems probable that since the pre-tutoring data were collected during the confusing first week of the academic quarter(s), the students were quite uncertain as to what to expect, but that after the first tutoring experience, most of their uncertainties were resolved.

The college-level studies were supplemented by a modest investigation of whether the mere anticipation of tutoring someone, during the course of being trained to tutor, has an incremental effect on the subsequent learning outcomes of the tutor. It is conceivable on social psychological grounds, that while one is exposed to relevant content material the anticipation of

tutoring someone is tantamount to the adoption of a relatively active teaching (or transmission) set; this set would then lead one to cognitively restructure ("package") the material. On the other hand, when one does not anticipate tutoring someone, i.e., when one adopts the relatively more passive learning set, there would be little reason to restructure the material. A second possibility is that the anticipation of tutoring is generally motivating in view of the enhanced status of the forthcoming role, and that this motivational boost promotes acquisition and retention.

Two groups, comparable to the samples on the main college-level studies, were exposed to the training materials for the usual 20 minutes. One of these groups (n = 13) was informed (incorrectly) that each person would subsequently be asked to tutor a peer on the materials. The other group (n = 21) was told (correctly) that our goal was simply to determine how much students such as they could learn from those materials.

The results failed to show any difference, $F(1, 32) = .22$, between the test performance of the anticipation group ($\bar{X}$ = 12.3) and that of the no anticipation group ($\bar{X}$ = 12.1). Moreover, the groups did not differ from the tutees in the main college studies ($\bar{X}$ = 12.55) who had their first training session. All three of these groups were outperformed by the actual tutors in the main studies ($\bar{X}$ = 15.15) who it will be recalled had had twice as much time with the materials as anyone else.

Subsequently, we came across an experiment by Allen and Feldman (1973), one purpose of which was "to determine whether tutors cognitively restructure the material in anticipation of teaching it to someone else." To test this, seven 5th-graders were asked after each 8-minute training lesson to verbalize into a tape recorder for 3 minutes everything they could remember about the training lesson. Content analysis of the open-ended verbalization showed no significant differences between those sessions when the students expected to tutor and those when the same students expected to study alone.

Concerning actual test performance, at first their students showed inferior performance after tutoring than after studying alone, but this trend was reversed in the last two sessions. In our judgment, the safest conclusion to draw from our own anticipation study and the Allen and Feldman study is that, given the very small samples, the hypothesis that mere anticipation makes a difference is still viable.

C. THE PUBLIC SCHOOL STUDIES

Our original plans called for a conceptual replication of our college-level studies on a public-school sample or two, in the interest of generalizeability. Implicit in those initial intentions was the question of whether the social psychological variables of equity (or status congruence) and of status level were relevant in public school settings. This question, in our view, is academic, considering the vast number of studies on sociometric status in the school-age peer group, and the demonstrated responsiveness of young children to the issue of equity (see Appendix C). Furthermore, while academic performance, per se, may not be as critical a status variable for the public school student as for the more self-selected undergraduate, being put "in charge" would certainly be germane for the former.

Nevertheless, we had other reasons for concern with the external validity of our college-level findings: (a) the possiblity that undergraduates looked upon that experience as an "experiment" in which the consequences of not doing well were minimal; (b) the fact that the total tutoring experience was quite brief; (c) the fact that the subject matter, while relevant, was not imbedded in normal sequence of course preparations; (d) the relative homogenity of the undergraduate sample with respect to "real" competence; (e) the fact that the age difference between the partners was in some cases as much as eight years; and (f) the large attrition rate.

To deal with some of these issues we altered the college-level design so as to allow, first of all, for four weeks of daily tutoring in math each week to be followed by performance and attitudinal assessments. The attitudinal items, closely paralleled, in meaning, those used in the college studies. The second revision was that all students were to exchange roles with their same-sex partners at the beginning of the third week and to continue on in those new roles for the balance of the study. These design changes enables us to study how the same student responds both to phases of role stability and to role exchange, without locking a given student into a role that he or she might initially regard as undesirable (as our theory and college data suggest), and to reduce the extent to which the impact of a given role might progressively attenuate over four weeks.

For the first public school study, 104 sixth-grade students in four classes of mathematics were recruited in the spring of the school year. Thus, unlike the undergraduate samples, the students were no longer strangers to one another. Five pairs were lost due to attrition, leaving 47 same-sex pairs who had completed all phases and filled out all instruments. To strengthen our argument here, too, we conducted replication study in the Fall of the next school year, with an initial sample of 134 sixth- and eighth-grade mathematics students. Attrition left us with 60 pairs whose data were usable. Thus, overall, sample attrition was minor compared to that in the college samples.

Since ANOVAs yielded no statistically significant main effects of the sample factor, the data from both studies were combined, and treated as one set.

Same-sex pairs were constituted with the tutor having greater (the status-congruent situation), equal, or less math competence than the tutee, based on actual prior grades and standardized math achievement scores. Daily tutor training and tutoring culminated in weekly review sessions that were followed by weekly assessment of performance and attitudes. After two weeks partners exchanged roles.

Two theoretical change models were constructed. The first was an 18-weight Phase Change model, to deal with the anticipated stability of outcomes from the end of Week 1 to the end of Week 2 (Phase 1) and from the end of Week 3 to the end of Week 4 (Phase 3), and with the anticipated instability of outcomes from the end of Week 2 to the end of Week 3 (Phase 2). Recall that students exchanged roles only at the beginning of Week 3. The second model was a 6-weight Global Change model. It is a compressed version of the more elaborate Phase Change model, and is concerned with the

amount and direction of changes in outcome between the first two weeks combined and the last two weeks combined. (For a more detailed description of both models, and their theoretical bases, see Appendix C.)

Application of both Change models to the data involved the use of both multivariate and univariate contrast analyses. Both models, especially the Global Change model, yielded highly significant results, with respect to felt satisfaction and perceived own test performance. The Global Change model also showed a significant effect on actual test performance. Actual test performance was also significantly correlated with perceived performance, despite the fact that the students received no feedback during the course of the study.

In sum, we were gratified by the obtained results, which clearly support the thesis that our underlying theorizing has external validity.

D. SUMMARY AND GENERAL DISCUSSION

Our research efforts began with a simulation study involving 75 undergraduates. They were asked to suppose that they had been assigned either to the role of tutor or of tutee with a hypothetical same-sex classmate whose knowledge of relevant subject-matter exceeded, equalled, or was less than the subject's. After an imaginary tutor training and tutoring session, half of the subjects were told that they would exchange roles for a second session, while the other half were told that they would continue in the same roles. All were to suppose that a second tutoring session then transpired. The dependent variables concerned subjects' estimates of their own performance and satisfaction, first with respect to the first session, then with regard to the second session. Initial analyses failed to confirm the predicted main effects of assigned role and tutor's relative competence on perceived own performance in the first session. Only one affective measure (felt importance) showed the appropriate effect of assigned role, while relative competence showed no discernible effects. Analyses of affective reactions to the second session clearly showed the predicted main effects of assigned role, but not of initial tutor's competence.

Since these analyses were insensitive to the effects of role continuity versus role change, and especially to changes in extent of status congruence (equity), two theoretical models were developed, one to deal with the initial session and the second with between-session changes. Post-hoc application of these models to the data were quite successful insofar as the affective measures were concerned, but not with respect to perceived performance. It occurred to us that there may have been too few available cues for estimating performance, given an unspecified task in a simulated relationship. Concerning the fact that status level was a more powerful determinant of satisfaction than status congruence, it seemed probable that this was to be expected both on theoretical grounds (as reflected in our theoretical models) and because of the relatively weak manipulation of relative competence.

Armed with the two theoretical models that were derived from the simulation study, we were able to carry out the college studies with greater feeling of confidence in our underlying theoretical assumptions concerning the social psychological implications of same-age peer tutoring, in the

measures that we had developed, and in the procedures that would be most optimal (the method of multivariate contrasts) for analyzing the data.

The two college studies, the second a replication which increased our sample of intact same-sex tutoring pairs to 89, were conducted in introductory educational psychology classes on course-related material. The two-session paradigm of the simulation study was again employed, except for the fact that all the activities were real, not hypothetical, that the manipulation of relative competence was based on actual relative pretest performance, and that, following each live tutoring session, both perceived and actual test performance were measured (along of course with the usual satisfaction measures). The first model which was applied to "first impressions" data collected prior to the first session failed to produce significant results. We reasoned that it was less successful than the Change model (which, it will be recalled, dealt with between-session changes), due to the likelihood that the pretutoring data were collected before students had much basis for inferring what the tutoring experience was going to be like. The Change model showed impressive predictive validity: Not only was satisfaction clearly influenced by (change in) role status and (change in) equity status (i.e., status congruence), but so, too, were perceived and actual performance influenced.

The fact that the same-class tutors in the college studies out-performed their tutees can, of course, be interpreted in ways other than that superior status motivates the tutor to learn and retain. For instance, the mere anticipation of teaching someone else may induce the tutor to organize more efficiently. Then, of course, in our college studies, the tutors have more exposure to the subject matter than did the tutees. As a supplemental check on this possibility, we led a handful of comparable subjects to anticipate they would be tutoring, while another small sample was given no such anticipation. Both groups were then exposed to the previously used tutoring materials. No tutoring ensued. When tested for performance, no difference was found between the two groups. Both groups did more poorly than the actual tutors in the main college studies. These results indicate that the previously found salutory effects of tutoring in actual performance are still interpretable as a practice effect. We are inclined to agree with Allen and Feldman (1973), who failed to find evidence on the facilitating effects, per se, of having to restructure the material, that the issue is far from resolved; the definitive study has yet to be conducted.

In any event, we turned to consider how we might best replicate, conceptually, our college studies in a public school setting.

It became clear that in the interest of external validity, several procedural changes were in order, such as making the tutoring and the subject matter more integral to the normal routine of the classroom, and abandoning the two-session paradigm in favor of an extended series of daily sessions over a four-week period. We also decided to alter the design in favor of having <u>all</u> tutoring partners exchange roles, which they did after two weeks. Our reasons for the change were that the new design would yield basically the same kinds of information as the old, without locking the tutees in the same (unsatisfying) role throughout. Furthermore, we felt that the role exchange would serve to keep student interest in the experience from flagging.

An initial and a replication experiment were conducted with two public school samples totalling 107 dyads.

Two theoretical models were constructed, the first being an elaborate 18-weight phase change model (to account for week-to-week changes) and the second 6-weight global change model (which essentially contrasts the change from the first two weeks combined to the last two weeks combined). Both models, but especially the less exacting Global Change model, yielded highly significant results, in the expected direction, with regard to felt satisfaction and perceived own test performance. Only the Global Change model successfully predicted actual test performance; it will be recalled that students received no feedback on actual performance during the study. In brief, the obtained results showed that our underlying theory did indeed have external validity.

Pleased though we are with the results of our various studies, it must be pointed out that the application of our theoretical models was not without some slippage.

Basic to these models are assumptions that (a) the role of tutor is more prestigeful than that of tutee and that (b) the fairest role assignment is to make that partner tutor who is the more competent of the two in the subject matter at issue. While our data are generally supportive of these two status-relevant assumptions, these exact questions were never put directly to the students. In the interests of completeness, these questions should be asked.

Of interest, too, is the related question of whether there might be sex differences in degree of concern with these status issues. It should be pointed out that we found no systematic sex differences on our measures; however, since all the pairing was same-sex, it is conceivable that differential concerns might obtrude in mixed-sex pairs. In principle, too, one might suppose that race differences could exist in terms of extent of concern with status issues; we found no evidence on our measures of differential outcomes due to racial composition of the pairs which, incidentally, had been constituted without regard for race.

The theoretical models imply that status level carries greater weight than does status congruence; the fact that our data reflect this could be attributed in part to the weak manipulation of relative competence (which, of course, was the operational definition of the status congruence or equity dimension). Recall that the weakness was deliberate. The intention was to make the role assignments less unpalatable in the 'inequity' conditions. The manipulation was weak in two respects. All pairs were formed from students who were in the same third of the class with regard to pre-tutoring achievement levels. Thus, the composition of these dyads with respect to task-relevant competence was relatively homogeneous. Furthermore, any difference in competence of the two partners was only represented to them in ordinal terms, rather than in absolute terms, or by absolute scores. Consequently, while partners nearly always agreed about their relative competence we do not know whether they also operated with the same absolute (differences in) magnitudes of own versus other's competence in mind.

Recall further that no interim feedback was given to the students concerning post-tutoring test performance, even in relative terms. It is conceivable that had they received such feedback, their roughly correct impressions, that tutors did better than tutees, would have received confirmation, on the average, and such confirmation would have intensified their feelings concerning the inherent fairness (equity) or unfairness of the role assignments. There are indications in the literature that subsequent performance is influenced by feedback to the tutors concerning their own or their tutee's performance (Heaton, 1975), but whether such feedback affects satisfaction remains an empirical question.

A more fine-grained examination of the slippage in our theoretical models has to do with their assumptions of symmetry, for the data reveal some assymetries. Perhaps the most noteworthy examples concern the superior tutors who later became tutees and the superior tutees who later became tutors. According to the models, the effects of the former should have been the most negative of all, while the effects on the latter should have been the most positive. In actuality, however, the former was more generally the case than the latter. Generally speaking, too, the outcomes of those in the tutor-tutee sequence ordered themselves better in terms of theoretical expectations than the outcomes of students in the tutee-tutor sequence. Why this occurred remains an unresolved question.

In order to shed further light on these slippages it may be necessary in the future to observe the tutoring process. For example, could it be that in our superior tutee condition, the partners informally exchanged roles to some degree, long before the formal exchange was produced experimentally? If so, it is conceivable that the dissatisfactions of the superior tutee before the formal exchange, and increased satisfactions after the exchange, were somewhat diluted by the tutee's having taken over some of the functions of the tutor, such as pushing for clarification, restating, and summarizing, and thus having effectively blurred some tutor/tutee role distinctions, with the tutor having, perhaps, abdicated some of his responsibilities. If, too, as Garbarino (1975) found, the nature of the incentives confronting the tutor can influence how the tutor interacts with the tutee, might not the same general principle be extended to the tutee? That is, might not the nature of the incentives confronting the tutee influence how he goes about interacting with the tutor?

V. CONCLUSIONS

A. CONTRIBUTIONS TO THE REDUCTION OF GAPS IN KNOWLEDGE

One of the areas in which systematic data have been singularly lacking has to do with the satisfaction that the tutee derives from the tutoring experience and the tutoring relationship. It was this gap in knowledge, one, incidentally, that Bloom (ca. 1976) also identified, which in large part prompted this project. We believe the gap existed because of (a) a preoccupation in the past with a level of analysis that focused only on the individual child (the tutor or the tutee); and (b) a failure to recognize some of the more important social psychological implications of peer tutoring, namely, that it also constitutes a miniature social structure whose position or role occupants are partly affected by the nature and location

(e.g., centrality or importance) of their positions in the structure, and by the manner of their recruitment to those positions. In plain terms, it is clear that tutees are relatively dissatisfied with their role compared to tutors.

A related gap that we have begun to fill has to do with the bases for the tutees' relative dissatisfaction. It is clear that the dissatisfaction does not arise simply because tutees are aware that they will profit less from the tutoring, performance-wise, when tested on what they have learned, than will their same-class tutees. Their dissatisfaction is due in large part to their having been assigned to a more peripheral, less prestigious, role than was the partner. It is also partly due in some cases to status incongruence or inequality, namely, the "patent unfairness" of being placed in that more peripheral role when one's competence relative to the competence of one's tutor, in the subject matter at hand, clearly "entitled" one to be the tutor.

Still another related gap has to do with the merits of turn-taking or exchanging of roles. The literature on peer tutoring contains prescriptions by some that only the more competent students should be tutors, and by others that every student should have an opportunity to take a turn at being the tutor. Furthermore, it is typically unclear what specific objectives these prescriptions are intended to further. We have shown that despite the level of pretutoring competence of tutees vis-à-vis their tutors, both the performance and satisfaction of tutees show an increase once they become tutors. But, in complementary fashion, the performance and satisfaction of their former tutors decline, after becoming tutees, again despite their relative level of pretutoring competence. We hasten to add that, where learning is concerned, we are not talking in terms of absolute improvements or decrements, but rather in terms of changes in gain rates.

It seems clear, therefore, that in the same-age tutoring context, there is no universal panacea that will maximize the learning and satisfaction of each student, since at any given stage of a tutoring relationship there are some inescapable zero-sum-like implications for the relative outcomes of the tutoring partners. What turn-taking in peer tutoring appears to accomplish is to "optimize" the joint (total) gains across partners and trials, by balancing off the decrements and increments in rate of gain of learning and satisfaction.

One might, of course, insist that in becoming a tutee, a former tutor gains valuable experience and insights into the role of the tutee, which, were he or she to become a tutor again, could only help to improve the quality of his/her tutoring. However plausible and perhaps desirable this outcome, it must be treated as an empirical question. Other tutoring-training techniques do not appear to have made a systematic difference; perhaps a turn at being the tutee might make a difference.

It is conceivable that this view of the functions of turn-taking would be seen as distasteful in some quarters, and prompt the counterproposal that peer-tutoring as a general pedagogical technique should be so organized within the classroom that children with complementary resources (competencies) and resource deficits are paired. Thus one would pair a child who is good

at math but poor in reading with a child who is poor at math but good in reading. The assumptions underlying such an alternative are (a) that competencies in the classroom are naturally distributed such that few children happen to be good at everything or at nothing, that has educational relevance, (b) that even if the natural composition of the classroom, competency-wise, permitted it, the teacher would have the time to serve as such a matchmaker. Unfortunately, there are no grounds for either assumption, particularly the former. One might be able to identify some children in the classroom who complement one another, but if the objective is to use this approach as a classroom-wide technique, rather than as a technique which might be applicable to some of the children in the class, the approach is doomed to failure. There may exist an ideal partner in the world for everyone, but one cannot dismiss the commonplace realities of the sociometric isolate or reject.

Another gap in knowledge concerns the interrelationships among the outcome variables in peer tutoring. For instance, the position taken by some educators and researchers (cf. Bloom, ca. 1976) is that while the principal goal of peer tutoring is to make students more effective learners, one might also explore whether peer tutoring leads to some useful byproducts in the form of affective changes. Stated in this way, the affective changes are not viewed as having any necessary relevance to performance changes. Our theorizing, by way of contrast, has been that (changes in) performance and satisfaction operate in tandem, so to speak. Furthermore, our results support this view. This suggests that one should not consider affective change as a tangential, extraneous, or independent outcome. Although the precise causal interconnections of classroom performance and satisfaction have yet to be determined, it is clear that while the two are not interchangeable products, they function in some interdependent fashion, such that signs of change in one might turn out to be predictive of change in the other. It must be emphasized, however, that we are only talking of satisfaction specific to the tutoring experience, and not about some of the other types of affective changes that a number of investigators have concerned themselves with. We have some comments to make below about those other affective areas.

B. RECOMMENDATIONS FOR ACTION

Future research needed

We studiously ignored, in formulating our research designs, the matter of how absolute levels of performance in a given subject matter are affected by peer tutoring. Since information of this sort is clearly of practical as well as theoretical importance, any attempts in the future to build on our present designs would need to incorporate appropriate control groups. There are at least two kinds of controls that would be needed. It would be important to have same-age peers spend the same amount of time in mastering, as individuals, the materials being used by their counterparts in the peer tutoring conditions. This would control for exposure to the content, per se. It would also be important to pair students, as heretofore, except that the times ordinarily spent in peer tutoring would be taken up with interactions of an irrelevant nature, as for example, in working together on some extraneous group task (see Rust, 1969). This would serve to control for the

effects of pairing, per se, i.e., for the effects of being in an extended dyadic relationship. A third, but much looser, kind of control is exposure to the relevant subject matter and to their peers that students receive under normal classroom conditions.

Although we have made much of the status variables inherent in same-age peer tutoring, a moot, hopefully researchable, question remains as to whether status considerations continue to be salient for the participants. While one of our theoretical models (the Phase Change model) anticipated this, our results were at best suggestive. A more definitive answer would require that the studies be carried out over a much more extensive portion of the school year. In so doing it would be important to build in a sufficient number of data points, so that the course of productivity and satisfaction could be charted more carefully. In this connection it might be useful to draw attention to some of Bales' theorizing concerning phases of group problem solving. It was his view that in work groups that eventually succeed in accomplishing their task, attention to the task-specific problems and to the interpersonal or human relations problems follows a predictable cycle. Groups that fail of accomplishment, on the other hand, might be expected to depart from such cyclic activity over time. The availability of a large number of temporal data points, coupled perhaps with direct observation, might serve to identify those operating characteristics that distinguish the more productive tutoring dyads from the less productive.

We indicated above that turn-taking seemed to be the optimal solution for balancing out the influence of status variables. Yet, it must be recognized that this conclusion was only founded on a context in which participants exchanged roles, not partners. In the absence of any compelling logic for predicting whether role change has more important or less important consequences than a change in partners, a data base is clearly necessary. It might be instructive to examine the relative consequences of simply trading partners, simply trading roles, or trading both. This immediately points to a further line of needed research, which entails the investigation of the relative outcomes of replacing partners having equal (unequal) relative competence with new partners that also have equal (unequal) competence. (If nothing else, the increased level of classroom activity inherent in such a design might have a salutory Hawthorne effect.)

The manipulations in the present studies were intended, of course, to engender self-other comparisons for theoretical reasons. In so doing they may have contributed to an individualistic, or perhaps even competitive, set. The empirical literature on small groups and some of the recent work on student learning groups suggest that it might be possible to attenuate this set or to replace it with a cooperative set, by leading the tutoring partners to believe that the objective is to see how well the tutoring dyad fares in competition with other such dyads, or by leading those in a particular role, say the tutee, to see how well he or she will do compared to same-role participants in other dyads. The experimental manipulation of an individualistic versus a group goal set would be a relatively simple matter, and might well provide some practical insights into the question of whether an emphasis in the dyad upon "promotive interdependence" has the

salubrious effect of facilitating performance while minimizing dissatisfaction on the part of the tutee.

Since feedback concerning performance is known to influence peer tutoring outcomes, another potentially fruitful line of research would be to determine whether, and if so, how, the provision of interim feedback interacts with the status variables we have been studying. In this connection, a related area of research might entail combining some of the major features of the experimental designs we have employed with some of the interesting group-goal features of the "teams-games-tournament" approach, in which interim feedback is an integral component. The latter approach treats the tutoring process as a dependent variable, yet there is no reason in principle why role assignment might not serve as an independent variable.

Practical concerns alone led us to employ a weak manipulation of differences in relative competence. It will be recalled that even in the "unequal" competence conditions, the partners were selected from the same third of the classroom distribution vis-à-vis initial competence in the subject matter. Research is now needed in which a stronger manipulation is employed. This is important, not merely on theoretical grounds, but also to determine the practical limits of such a manipulation. The basic question is, how lacking in competence can a tutor be and still gain from the experience?

Exceedingly few studies in the peer tutoring area have involved systematic observation of the tutoring process. Much as we deplore this lack, we urge that it not be pursued in an atheoretical fashion, i.e., as a goal which may turn into little more than a methodological exercise. There are many substantive issues that might be fruitfully pursued, including the manner in which the tutoring process mediates between such structural factors as group composition (with respect to competence, length of acquaintance, mutuality of attraction, sex, etc.), and the outcomes of peer tutoring, or between the characteristics of the task (as for example, the particular subject matter) and those tutoring outcomes.

So far as we know, most investigators of same-age peer tutoring have only employed one subject matter or content area in any given study, as for example, spelling or reading, or mathematics. A few investigators have exposed <u>all</u> the participants to more than one substantive area at a time (Morgan & Toy, 1970; Poole, 1971). Yet researchers and educators are intensely interested in the question of generalizability beyond any particular subject matter to other academic areas, to say nothing of whether the outcomes in a particular area have lasting value. A potentially fruitful avenue for research would entail treating the number of substantive areas as a variable in order to see whether students who tutor classmates in more than one content area, and their partners, show more lasting effects in these particular content areas than tutoring in one content area alone (assuming a content area is amenable to tutoring), and whether such effects generalize in turn to academic areas in which tutoring did not take place. This is not the place to consider at length the theoretical and practical ramifications of such a research objective. Suffice it to say that research of this sort is needed to determine whether greater short- as well as long-range benefits might arise from the attempt to make the tutoring experience

more than an isolated busboy's holiday on a circumscribed topical (tropical?) island. This is not simply the issue of transfer of training as traditionally viewed. It also concerns the extent to which the affective issues inherent in peer tutoring become salient enough for the typical participants so that they transcend topical boundaries.

With respect to the multiple-area approach, it will be recalled that we touched in somewhat disparaging terms upon the overall prospects of forming tutoring pairs of children with complementary resources (area competencies) and resource needs, if one hopes to reach every child in the classroom. At the same time, the genuinely researchable possibility suggests itself that in addition to determining the effects of role exchange and partner exchange (of similar or dissimilar relative competencies), one ought to investigate the effects of exchanging content areas. The question might be asked, for example, whether a tutee in arithmetic shows any greater or lesser increment in performance and satisfaction on subsequently becoming his partner's tutor in arithmetic, than if the former tutee in arithmetic was then asked to tutor his partner in reading. Assuming one could build in the appropriate controls, and that it is defensible to talk about the amount and direction of change (both cognitive and affective) between standardized scores in academic area A and standardized scores in academic area B, such an approach might also shed some light on the "transfer of training" problem in its wider ramifications.

Proposed applications

What are some of the immediate implications of these studies on same-age peer tutoring? First of all, it is clear that the classroom teacher can proceed to employ the role-exchange-same-partner approach to dyadic peer tutoring in a particular subject matter, with reasonable assurance of optimizing the potential benefits of peer tutoring for the typical student. Ideally speaking, the proper measurement of progress in that subject matter presupposes that both the study material and the test material are reliable indicators of mastery; we know, of course, that reliability is facilitated if the study and/or test material can be objectified.

Even in the absence of standardized and/or objectified material, however, this should not dissuade the teacher from employing peer tutoring. There are two interconnected reasons for this: (a) Students can rate their satisfaction with the tutoring experience regardless of the nature of the tutoring material; it is just as easy to elicit such ratings when the content concerns social studies as when it concerns mathematics. (b) The studies we have concluded point to the fact that performance and satisfaction operate in tandem. Consequently, where it is difficult to measure performance by some objective scoring procedure, a reasonable inference from rated indications of satisfaction is that there have also been performance gains.

A second immediate implication is that the teacher can proceed to use the role assignment approach to pairing, with reasonable assurance that most students can be paired off without disruptive consequences. It is noteworthy that although the teachers in our public school studies were given veto power in the event that they considered any particular dyad of our randomly constituted dyads dysfunctional (i.e., where the students were

alleged to be enemies), they essentially refrained from exercising that power. Moreover, there were no reported instances of dissatisfaction so strong as to interfere with the continuation of any dyad. No student came forward to state that he or she refused to work with the assigned partner. We have indicated earlier why the alternative procedure of allowing students to select their own partner would be less than optimal for those students who are likely to be the sociometrically underchosen, if not the isolates, and who may well be most in need of those benefits that can come from being in a peer-tutoring relationship.

Concerning the relevance of sex in pairing, we are not in a position to make any recommendations, since our research was restricted to same-sex tutoring. We would surmise that it may be more relevant with some age groups than with others. On the other hand, we do recommend that pairing be without regard for race. In our studies we failed to find <u>any</u> systematic effects of same-race (all-white, all-black) versus cross-race pairing, or of initial tutor's race or initial tutee's race, on the outcomes of peer tutoring.

Still a third immediate implication of these studies is that the management of the peer-tutoring activity by the teacher need not be burdensome. In fact, it might even be more efficient to train some of the students in how to relay appropriate information to the remainder of the class, thereby insuring some form of individualized instruction, without the teachers repeatedly having to teach the same material to a number of small groups in the classroom. Efficiency is also furthered by freeing up the teacher, somewhat, to apply her efforts where they are most needed. To the question of what we have in mind by "appropriate information," a first approximation would be the kinds of material that are typically to be found in the work sheets that teachers distribute to the individual student.

What of the long-range implications of same-age peer tutoring? Our stance would have to be that any proposed answer would be premature at this time. It would be apparent by now that there are many important questions about the short-range consequences of such tutoring that still need to be resolved through research, before we can begin to think seriously about its long-range implications. We also need to ask whether the long-range consequences which some investigators have looked for, or urge pursuing (e.g., Bloom ca. 1976), are realistic.

One set of long-term consequences of same-age tutoring has, of course, to do with the lasting impact of that experience on the individual student participant. Unfortunately, instead of asking the relatively more modest question, of whether an intensive peer-tutoring experience, say in fourth-grade mathematics, will improve his or her performance in, and attitudes towards that subject matter, and whether the <u>specific</u> attitude will persist in the fifth and sixth grades, a not uncommon goal is to look (typically in vain) for such effects as an improved <u>overall</u> attitude toward school, or to an enhancement in the student's <u>chronic</u> level of self-esteem. There are several assumptions implicit in the adoption of such ambitious, transsituational goals that, if not altogether unwarranted, have yet to be justified empirically. For instance, there is the implicit assumption that a tutoring experience in one subject matter can contribute much to such

omnibus variables as an overall attitude toward school or toward the self. In addition, there are the presumptions that a tutoring experience in one subject matter counts as much, and is interchangeable with, a tutoring experience in another subject matter. From the student's perspective, these latter assumptions would mean that being the tutor in social studies is as important, i.e., carries as much status and therefore contributes as much situational self-esteem, as being the president of the Latin club, or the chief cheerleader, or the team quarterback, and that being the tutor in social studies can balance off being only the waterboy on the school football team.

We can summarize these issues by reference to a hypothetical multiple regression model in which the various predictor variables are the tutoring experiences specific to various discrete content areas, and the criteria are such variables as overall attitudes toward school or toward the self, or SAT scores, or entering college. Such a model provides information as the differential magnitude of contribution, if any, that such tutoring experiences make to the criterion. Until investigators attempt to employ some such model as a research strategy for shedding light on these implicit assumptions, it would be advisable, we repeat, for the educational practitioners to limit themselves to the more concrete, more modest, goals of facilitating performance and satisfaction in specific content areas through the same-age peer-tutoring mechanism. Such long-term goals as self-actualization, socialization, and improvement in the overall self-concept are devoutly to be wished, but there are more proximal goals that should be pursued first before we can determine whether such wishes are realizable. In saying this we do not necessarily imply that such goals fall outside of the province of education.

Another set of long-range implications of same-age peer-tutoring has to do with its possible impact on the overall quality of education that a school system provides. It is conceivable, for example, that the protracted, system-wide use of such a supplement to regular classroom instruction will increase the overall achievement levels of, and incidence of merit scholars in, that school system, reduce the disturbance and absentee rate, and the like. Is this wishful thinking? Perhaps. But we won't know until peer tutoring is conducted on a school-system-wide scale over a period of several years, and the school administration carefully sets about charting the progress, if any, that is made over those years by those classroom units in the system that are to employ tutoring as against those that are not. Obviously, the proper implementation of a self-initiated effort of such scope will require the prior acceptance of such an enterprise into the peer culture of the school system's personnel.

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APPENDIX A

TO HELP OR BE HELPED:
SOME CONSEQUENCES OF STATUS AND STATUS CONGRUENCE IN PEER TUTORING

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Abstract

In certain types of helping relationships, such as peer tutoring, the manner of role assignment may make salient the issues of status level and status congruence, thereby affecting performance and morale. The literature suggests that a status congruent (equitable) relationship facilitates performance more than does an incongruent relationship. However, it contains conflicting accounts regarding morale. A simulation of dyadic peer tutoring involving two hypothetical tutoring sessions, with role exchange for half the sample in the second session, was conducted to test the hypotheses that status congruence (i.e., tutor's competence exceeding tutee's), more than incongruence, facilitates performance and satisfaction, especially for the tutor. Initial analyses confirmed the predicted effect of role status but not of status congruence. To provide a more sensitive test of the contribution of status congruence, one theoretical model was derived for application to the first session, and a second model to the more complex design involving intersession role exchanges. Application of these models to the data through multivariate contrast analyses confirms their usefulness, and points to their potential value for investigating other helping contexts.

TO HELP OR BE HELPED:
SOME CONSEQUENCES OF STATUS AND STATUS CONGRUENCE IN PEER TUTORING

Suppose a needy person were offered help by a potential donor whom the prospective recipient regarded as unworthy or as not particularly deserving of possessing that relevant resource. Would the needy person accept if he were in a position to refuse it? Would he accept money that the other had stolen, or found? Would he accept a resource that the donor had obtained through ascription rather than through achievement or investment? The literature provides no clear answer.

Studies of help seeking have shown that a needy person will accept help provided that he expects to have an opportunity to reciprocate. One explanation is that indebtedness, or the feelings of inequity that would arise from the unilateral social exchange of being helped, is an aversive state which a needy person prefers to avoid (Greenberg & Shapiro, 1971; Morris & Rosen, 1973). Clark, Gotay, and Mills (1974) have qualified these findings by showing that acceptance of help conditional on opportunity to reciprocate holds when the donor is attitudinally similar; the opposite holds when the donor is attitudinally dissimilar. Unfortunately, attitude similarity (or its close correlate, attraction) is conceptually too remote from the issue of whether the potential donor deservedly possessed the needed resource, to derive clear answers to our initial questions.

It has also been proposed that a needy person would avoid accepting help, so as not to validate the potential donor's implicit claim to

superior status and therefore to power over the recipient.(Blau, 1954; Homans, 1961). There are data indicating that people whose task performance was unexpectedly below par do not seek help (Morris & Rosen, 1973; Tessler & Schwartz, 1972). While the basis for this avoidance was attributed to a desire to maintain self-esteem, the behavior could also signify a desire not to validate or legitimize, publicly, the potential donor's implicit claim to superior (task-) competence status.

To push our initial question further, suppose that acceptance of help from someone possessing ascribed rather than earned superior status were inescapable. How would a reluctant recipient react to this imposed exchange relationship? As a case in point, suppose a student were assigned to receive tutoring from a classroom peer on a subject-matter in which the tutor was perceived by him to be even less competent, or not more competent, than he. What effects would this have? More specifically, how would the tutee's task-relevant performance and his morale fare?

An answer to the problem can be approached by noting that such a hypothetical situation exemplifies a relationship of status incongruence. A condition of status congruence is said to exist when a member holding a particular rank on one relevant status dimension holds the same rank on the other pertinent status dimensions. Had the more competent peer been assigned to the more prestigeful role of tutor, a relationship of status congruence would have existed.

The evidence is unequivocal concerning the effects of status congruence on the performance of the average member of a task group: it facilitates performance. Where satisfaction or morale is concerned,

some studies indicate a direct effect (Exline & Ziller, 1959); others an inverse effect (Kardush, 1968; Sampson, 1969); and still others no overall effect (Moore, Johnson, & Arnold, 1972).of status congruence on the average member. One possible rationale for this discrepancy may be derived from Sampson (1969).

He maintains that the effects of status congruence on both performance and satisfaction are mediated by the extent to which the situation promotes task mastery and justice. A status-congruent group provides clearer expectations to its members of how each member will behave than does a status-incongruent group, and therefore, is relatively more promotive of task mastery by the group than is a status-incongruent group.

Justice, for Sampson, is of two kinds, equity and equality. Equity signifies, as it does for Adams (1965) and many others (cf. Adams & Freedman, 1976), that each member's rewards relative to his investments are equivalent to the corresponding ratios of the other members. A status-congruent relationship in which a position of higher status (such as that of tutor) is assigned to the more task-competent member would be equitable. The justice of equality refers to the more familiar version of equal reward distributions regardless of investments and to a less familiar variant involving overall status equality that Brandon (1965) used; namely, of assigning more of a leadership role, by way of compensation, to people ranking lower on other status dimensions. According to Sampson, an equitable (i.e., status-congruent) relationship is more satisfying to the average member than an inequitable one, if the

situation makes salient the element of individual competition, or carries an aura of the marketplace; the reverse is apt to be true when such conditions are nonsalient and/or the emphasis is on team rather than on individual performance (Kardush, 1968; see also Cohen, 1974; Lerner, 1974). The experiment by Kardush (1968) is considered by Sampson to epitomize the latter situation since status congruence (brought about by assigning a graduate student to be Captain, an upper division student Sergeant, and a lower division student Private) was indeed less satisfying than status incongruence. Sampson neglects, however, to incorporate in this theorizing the important qualifier advanced by Kardush that, even though equality, which in Brandon's sense meant status incongruence or inequity, was preferred on the average to inequality, the lower the job rank of a team member, the less he liked his job, and the more he expressed a willingness to change jobs, regardless of whether status incongruence existed. Moore et al. (1972) also noted more role dissatisfaction on the part of peripheral members in status-incongruent than in status-congruent communication networks.

Since our hypothetical relationship involves classroom peers, and a classroom setting typically makes individual achievement, if not competition, salient, it would seem to follow that a status-congruent (equitable but unequal) tutoring relationship would facilitate the performance as well as satisfaction of the dyadic unit more than would a status incongruent (inequitable but equal) relationship. At the level of the individual member, however, the tutor would be more satisfied with his assigned role than would the tutee, regardless

of the degree of status congruence. Furthermore, the tutor's performance is likely to be superior to that of the tutee, partly because of the greater incentive value of being tutor and partly because of the advantage he derives from having to organize (encode) the material for purposes of communication to the tutor. In this connection it might be noted that tutors have been shown to achieve superior learning than do tutees (Allen, 1976; Gartner, Kohler, & Reissman, 1971).

Method

A simulation experiment was conducted with 75 undergraduate volunteers from several summer classes in psychology and education. They were told to suppose that they had been randomly assigned to being the tutor (or the tutee) of a hypothetical same sex partner from the same class, and that they had scored "higher than" ("the same as," or "lower than") their partner in a pretest on relevant academic subject matter. Their first impressions were then solicited in a group-administered questionnaire containing two (seven-point) rating scales that dealt with how they and their partner were each likely to perform, several bipolar rating scales in which they were to evaluate their assigned role (important-unimportant, valuable-worthless, effective-ineffective, powerful-powerless), and two rating scales concerned with how enjoyable the tutoring session was likely to be for them and for their partner.

On completing this initial questionnaire they were asked to pretend that the tutor was then given training in how to tutor, that the tutor had then proceeded to tutor, after which both partners had taken an imaginary posttest on relevant material. Their responses

to this "tutoring session" were then solicited in a "second impressions" questionnaire, which included two new pairs of items; how indebted they and their partner each felt toward one another, and how much they and their partner each desired to switch roles with the other. Through printed directions, one-half of the pairs were then informed that the roles would now be switched and the other half that they would not. All subjects were told to imagine that a second tutor training-and-tutoring session had then occurred and that it was followed by a second posttest that both partners took. A third impressions questionnaire that was identical to the second questionnaire was then administered.

The design applicable to the first two questionnaires consisted of two independent variables, assigned role (tutor vs. tutee) and tutor's (pretest) competence relative to that of his tutee. Competence had three levels, superior tutor, equal tutor, and inferior tutor. Assigned role is addressed to the issue of status level; tutor's relative competence is addressed to the issue of status congruence, or equity, with the superior tutor condition reflecting status congruence, and the equal and inferior tutor conditions reflecting increasing levels of status incongruence. For analysis of the third (final) impression data, the design was expanded to include both first assigned role and second assigned role, in addition to the initial tutor's competence.

Results and Discussion

We deal, successively, with the data pertaining to the first impressions; second impressions, i.e., reactions to the first tutoring session, and third impressions, i.e., responses to the second tutoring session. Only data bearing on subjects' own feelings and reflections

on own performance are described here because subjects' estimates of partners' feelings were nonsystematic.

Concerning subjects' first pretutoring impressions on how they expected to perform, the predicted main effects of assigned role and tutor's competence failed to materialize. Instead a significant Role x Competence interaction was obtained, $F(2, 69) = 3.22$, $p < .05$; tutors' estimates in the superior tutor condition were inappropriately lower than those of their tutees, but appropriately higher in the other two conditions. Insofar as anticipated satisfaction was concerned, the predictions again called for main effects of both role and competence. The effect of role on role evaluation was significant in the case of three (important, valuable, powerful) of the four relevant items ("effective" was not significant) and on an index based on a simple summation of the four ratings, namely, $F(1, 69) = 9.61$, 9.56, 8.94, and 10.32, respectively, with $p < .005$, in each case. The effect of role on anticipated enjoyment was not significant. However, there was a significant main effect of competence, in the predicted direction, $F(2, 69) = 3.59$, $p < .05$. Role evaluation showed little effect of competence.

Concerning the second impressions data, which dealt with reactions to the first tutoring session, the predicted main effects of role and tutor's competence on perceived own posttest performance, were again nonsignificant. Subjects' affective reactions for the first tutoring session showed an appropriately significant main effect of role on one role evaluation measure, important, $F(1, 69) = 5.81$, $p < .025$,

also of tutor's competence on desire to switch roles, $F(2, 69) = 4.10$, $p < .025$. Seven of eight remaining measures yielded nonsignificant results in the predicted direction.

The third impressions data, which involve reactions to the second tutoring session, produced a significant main effect of second role as predicted, $F(1, 63) = 14.94$, $p < .001$, but no effect of initial tutor's competence. Insofar as the affective responses were concerned, tutors compared to tutees evaluated their own role significantly more positively; important, $F(1, 63) = 5.69$, $p < .025$; valuable, $F(1, 63) = 5.76$, $p < .025$; effective, $F(1, 63) = 7.90$, $p < .01$; powerful, $F(1, 63) = 4.71$, $p < .05$; composite measure, $F(1, 63) = 8.15$, $p < 01$. Tutors also reported enjoying the session more than did tutees, $F(1, 63) = 5.69$, $p < .025$.and expressed less of a desire to switch roles (were there to be another session) than did tutees, $F(1, 63) = 5.33$, $p < .025$. There were no significant main effects of initial tutor's competence on any of the satisfaction measures. A significant interaction effect of first role and competence on felt indebtedness proved uninterpretable.

It is clear from the above results that the (third impressions) responses to the second tutoring session were most supportive of tne hypotheses, particularly with regard to the satisfaction measures. However, these third impressions analyses fail to indicate what effects role continuity and the prior sets of responses had on the final set of responses. Inspection of the data reveals, for example, that in their final report, tutees who became tutors, in comparison with all the rest, gave the most favorable estimates of their performance

on the second posttest, and evaluated their own role most favorably. By way of contrast tutors who became tutees gave relatively low estimates of own performance (as low as those who remained tutees), and evaluated their own role least favorably. Furthermore, the estimates of own performance of tutees who became tutors increased rather highly and their role evaluation showed the greatest increase over time.

It is also apparent that the effects of assigned role were more clearcut than those of initial tutor's competence. Yet inspection of the data often revealed, for example, that the decline in satisfaction shown by tutors who became tutees was greatest, relatively speaking, in the superior, i.e., initially status-congruent, tutors.

Because of the limitations of the above third impressions analyses and the fact that the global hypotheses advanced fail to discriminate individuals in a given role sequence who had a particular level of competence from their partners, two explicit theoretical models were then developed to more adequately account for these data, as described below.

Two Theoretical Models

One model, to be called the Session I model, was derived for application to the simpler 2 x 3 design of the first tutoring session, with particular reference to the first impressions data which preceded that first session. A more elaborate model, the Change Model, was developed for application to the 2 x 2 x 3 design of the second tutoring session in order to account for the differences between the third impressions which followed, and the second impressions which preceded, that second session.

The Session I model was derived from two key propositions. The first proposition is that being assigned the role of tutor carries more status and is therefore more desirable than being assigned the role of tutee, both with regard to the role's direct (anticipated or experienced) effects on the individual's performance and his relative satisfaction. The extensive peer tutoring literature, which is largely cross-age, does suggest (Adams & Freeman, 1976; Gartner et al., 1971) that the learning outcomes of tutors exceed those of tutees, although there is little agreement as to why this should be. With regard to satisfaction, the literature is, at best, indirect. For instance, Salomon and Achenbach (1974) reported tutors as more satisfied with the tutoring experience than were same-age tutees; however, the tutors had tutored younger students, whereas the tutees in question were tutored by adults. Kardush (1968) reported that her subjects assigned to be Captain rated their position as more desirable and enjoyable, whereas those assigned to be Private rated their position as least desirable and enjoyable, both before and during the game.

The second proposition is that an equitable (status-congruent) role relationship has a more desirable effect on performance, and is more satisfying, for the average member of a same-age peer tutoring pair, than an inequitable role relationship. The rationale for such a proposition was provided earlier. In the model, two degrees of inequity were specified; namely, strong inequity where someone of lesser pretest competence is assigned to tutor a partner of relatively greater competence, and weak inequity where one person is assigned to tutor an equally competent partner.

The dimension of tutorial status was translated somewhat abritrarily into two values; (+1) for being the tutor, and (-1) for being the tutee. The equity dimension was translated into three values; (+1) for equity, (0) for weak inequity, and (-1) for strong inequity. The relevant values were then added across the two dimensions for each treatment combination. For example, in the case of a relatively less competent tutor, a value of (+1) for being tutor was added to the value of (-1) for being in a strongly inequitable relationship, yielding a weight of zero (0) for that cell. Since two of the six weights of the Session I model were zero, and since a zero weight in the comparison or "contrast" analyses (Hays, 1963; Winer, 1971) that were planned leads essentially to the omission of the relevant cell mean from the analysis, the theoretical weights were modified slightly. Each of the three weights applicable to the role of tutor was increased by +0.1, while the three theoretical weights applicable to the tutee's role were decreased by -0.1. The adjusted theoretical weights are shown in Table 1.

The change model, likewise, was derived from two key propositions. The first was that the impact of a change in role status is greater than the impact of a continuation in role status. Specifically, an undesirable-desirable sequence has a more beneficial effect on performance and satisfaction than a desirable-desirable sequence, while a desirable-undesirable sequence is less beneficial than an undesirable-undesirable sequence. This proposition is consistent with similar assumptions made elsewhere (cf. Aronson & Linder, 1965; Sampson, 1969).

The second proposition, which is quite consistent with the key tenets of equity theory (Adams, 1965; Walster, Berscheid, & Walster, 1973), is that the impact of a change in degree of equity in the role relationship is greater than the impact of a continuation in its degree of equity, the amount and direction of change in performance and satisfaction being proportional to the amount and direction of change in degree of equity. The dimension of (change in) tutorial status was translated into the following four theoretical values: (+3) for change from tutee to tutor; (+1) for continuation as tutor; (-1) for continuation as tutee; and (-3) for a change from tutor to tutee. The dimension of (change in) equity status was represented by five theoretical values: (+2) for change to strong equity (i.e., where a more competent tutee became tutor); (+1) for continuation of strong equity (i.e., a more competent tutor remained tutor); (0) for a reversal or continuation in weak inequity (i.e., where an equally competent tutor either became the tutee or remained the tutor); (-1) for continuation of strong inequity (i.e., a less competent tutor remained tutor); and (-2) for change to strong inequity (i.e., a more competent tutor became the tutee). To involve all cell means the theoretical weights produced by summation of the relevant values across two dimensions were subsequently adjusted by adding 0.1 to the weights of those in the tutor-tutor sequence and subtracting 0.1 from the weights of those in the tutee-tutee sequence. The adjusted theoretical weights are shown in Table 2.

Application of Models

With regard to the Session I model, a multivariate contrast analysis, essentially an adaptation of Hotelling's T^2 (Bargmann, Note 1). was applied to the set of dependent variables comprising the first impressions questionnaire. This test on the eight means proved significant ($F(8, 60) = 2.68$, $p < .05$).

The univariate contrast Fs were significant, in the appropriate direction, for the measure of expected own enjoyment, $F(1, 69) = 4.35$, $p < .05$, and for three of the four measures of role evaluation, namely, important, $F(1, 69) = 8.35$, $p < .01$; valuable, $F(1, 69) = 5.10$, $p < .05$; powerful, $F(1, 69) = 6.99$, $p < .025$; and for the composite role evaluation measure, $F(1, 69) = 6.39$, $p < .025$. The obtained means for expected own performance, enjoyment, and the composite evaluation measure are shown in Table 1 for illustrative purposes. A crude approximation of goodness of fit to the model can be obtained by correlating a given set of obtained means with the set of theoretical weights. In the case of enjoyment, for example, the correlation is +.70.

For multivariate contrast analysis pertaining to the Change model, the twelve appropriate contrast weights shown in Table 2 were applied to the twelve change score means (third session minus second session) of all twelve dependent variables, at once. This test proved significant, $F(12, 52) = 5.65$, $p < .001$. A second multivariate contrast, performed on the four different measures of role evaluation, was also significant, $F(4, 60) = 7.14$, $p < .001$, a fact which supports the use of the composite score of role evaluation. (The average third impressions r among the four measures was +.74.)

The relevant univariate contrast F's based on the change score analyses are presented in Table 3. The obtained means for own performance, enjoyment, desire to switch, and composite role evaluation are shown in Table 2, for illustrative purposes. Their correlations with the appropriate theoretical weights shown are, respectively, +.63, +.67, -.77 (keyed in the direction of dissatisfaction), and +.68. It is clear that the model was most successful with those self-report measures involving role evaluation, own indebtedness, and own desire to switch roles. Furthermore, it is again apparent that the self-report measures were more successful than those where participants were asked to infer the performance and affective reactions of the partner. We had tacitly assumed that inferences concerning the partner's reactions would represent logical complements, rather than equivalents or projections, of the participants' own reactions. There was no evidence either for a pattern of complementary responses or of equivalent responses.

General Discussion and Conclusions

The Session I model, as applied to respondents' first impressions, received strong support from most of the measures of role evaluation and from the measure of own enjoyment. The change model, in turn, received strong support from the measures of role evaluation, to a lesser extent from the measures of own enjoyment and own desire to switch roles, and marginal support from the measures of felt indebtedness and own performance. While "indebtedness" may be conceptually relevant, it is a moot question of whether the term, per se, had unambiguous meaning for the respondents. Concerning perceived performance,

it may be that the simulation context is one in which respondents find it more difficult to report systematically regarding level of own performance on a relatively unspecified task than on own satisfaction with an imagined (change in) role relationship. To this we might add that respondents probably find it easier to engage in self-reporting than to report systematically on how an imaginary role partner did, felt, and changed over time.

Although the measures of own performance were less supportive of the change model than those of own satisfaction, both types of measures were influenced in parallel fashion by the simulation manipulations. This is consistent with our initial supposition that in the kind of helping situation represented by same-age peer tutoring, relative performance and morale go hand in hand, rather than operate at cross purposes.

Perhaps the greatest effects obtained were concerned with the relative worth the participants came to attach to their own role in the relationship. Still to be addressed is the question of why status level contributed substantially more to these effects than did status congruence. One could posit, with some justification, that the manipulation of competence (status congruence) was relatively weak compared to the manipulation of status level. There are also theoretical reasons: Equity theory does not discount the fact that, while people prefer equity to inequity, they also wish to maximize their own outcomes. Adams (1965) acknowledges, for example, as does Kardush (1968), that it is less upsetting to be overcompensated than undercompensated. From this reasoning it would seem to follow that

status level is a more powerful determinant of satisfaction than is status congruence. A definitive resolution of this conjecture has yet to be attempted.

It would also be useful to determine the relative predictive value of such models under group-task versus individual-task conditions, and under individual payoff versus group payoff conditions. There are, of course, helping relationships of a totally different sort, such as those that go on in crisis intervention centers, where the tasks are more concerned with bringing about changes in feeling than in production levels. It would be of interest to explore whether comparable models of status and status congruence can be applied to such helping relationships. The present results suggest that they may well be applicable.

Reference Notes

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Footnotes

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Table 1

Adjusted Weights for Session I Model and

Illustrative Obtained Means

First Assigned Role	Tutor's Pretest Competency Relative to Tutee's					
	Greater		Equal		Less	
	Weight	Mean	Weight	Mean	Weight	Mean
Tutor	2.1	4.79	1.1	5.42	0.1	5.25
		5.43		5.08		4.00
		20.93		20.92		20.92
Tutee	-0.1	5.67	-1.1	4.73	-2.1	4.00
		4.67		4.91		4.07
		16.67		17.91		16.93

Note: First row means refer to expected own performance, second row means refer to expected own enjoyment, third row means refer to the summed role evaluation ratings (important, valuable, effective, powerful).

Table 2

Adjusted Weights for Change Model and

Illustrative Obtained Means

Role Sequence (across sessions)	Initial Tutor's Pretest Competency Relative to Initial Tutee's: Greater		Equal		Less	
	Weight	Mean	Weight	Mean	Weight	Mean
Tutor-Tutor	2.1	.14	1.1	.67	0.1	.17
		.14		.00		.83
		-.86		1.17		-1.00
		1.43		-1.17		.00
Tutor-Tutee	-5.0	-.57	-3.0	-.66	-1.0	.17
		-1.14		-.50		.83
		2.29		2.17		-1.00
		-5.57		-4.83		-1.50
Tutee-Tutor	1.0	.33	3.0	.20	5.0	.29
		.00		.20		1.71
		-2.33		-1.20		-3.00
		7.00		1.40		2.14
Tutee-Tutee	-0.1	-.67	-1.1	.17	-2.1	.00
		.33		.33		.57
		.17		.83		-.57
		-.67		.67		.43

Note: First row means refer to own performance, second row means refer to own enjoyment, third row means refer to desire to switch, fourth row means refer to the summed role evaluation ratings (important, valuable, effective, and powerful).

Table 3

Univariate F's from the Change Score Contrast Analyses

	Dependent Measures	F(1, 63)	p
1.	Own posttest performance	3.46	.10
2.	Inferred partner's posttest performance	<1	NS
3.	Own enjoyment	8.20	.01
4.	Inferred partner's enjoyment	1.45	NS
5.	Important	25.14	.001
6.	Valuable	19.62	.001
7.	Effective	14.27	.001
8.	Powerful	10.64	.005
9.	Own felt indebtedness	3.23	.10
10.	Inferred partner's indebtedness	2.51	NS
11.	Own desire to switch	6.95	.01
12.	Inferred partner's desire to switch	<1	NS
13.	Role Evaluation composite (Sum 5-8)	23.80	.001

APPENDIX B

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Peer-Tutoring Outcomes as Influenced by the Equity and Type of Role Assignment

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This field experiment, with an initial sample of 178 undergraduate classmates engaged in same-age peer tutoring, was conducted to test a theoretical model that attached greater desirability (a) to be the tutor than tutee and (b) to be in an equitable (status-congruent) rather than inequitable relationship. Same-sex pairs were formed such that the tutor had relatively greater (the equity condition), equal, or lower pretest competency than the tutee. Partners in half the pairs exchanged roles for the second of two tutor-training and tutoring sessions. Overall application of the method of comparisons and multivariate analyses of variance clearly supported the model: Participant satisfaction, perceptions of good performance, and actual performance were directly dependent on becoming tutor and entering an equitable tutoring relationship.

What deters a needy person from seeking help? When is it unsatisfying to accept help? It has been shown that if the circumstances are such that receiving help would lead to unresolved feelings of indebtedness, then a person in need of help will avoid entering into such an inequitable relationship with a potential donor (Greenberg & Shapiro, 1971; Morris & Rosen, 1973).

It has also been suggested, but not yet demonstrated experimentally, that a person may refrain from seeking help to avoid validating the donor's implicit claim to superior status and, as a consequence, the right to impose future demands (Blau, 1964; Homans, 1961). There is experimental evidence also that people whose task performance is unexpectedly below par are reluctant to seek and accept help (Morris & Rosen, 1973; Tessler & Schwartz, 1972). The potential helper was a set of written guidelines in the Tessler and Schwartz study but a live peer in the Morris and Rosen experiment. Consequently, while both findings were interpreted as due to a desire to maintain self-esteem, it is also possible, particularly in the Morris and Rosen experiment, that the needy person was prompted by a desire to avoid a public acknowledgment of the donor's higher competency status.

Status considerations may, conceivably, affect a needy person's behavior in still another way. Suppose, for example, that the potential donor came into possession of the relevant resource in ways that the recipient considered to be undeserved, for example, through ascription or chance (i.e., through no investments) rather than through investments in the form of achievement or competency. The acceptance by the recipient of such a resource from the donor might only serve to legitimize the "illicit" superior status of the donor.

Situations may arise, however, in which a needy person is under external pressure to accept help or in which he can attain important goals only by accepting help from a donor whose possession of relevant resources he considers to be undeserved. The

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consequences for the recipient of entering into such an *inequitable* or *status-incongruent* helping relationship can be viewed along two major dimensions. The first consists of performance considerations, that is, the recipient's ability to achieve a higher level of performance by virtue of the newly acquired resources. The second dimension concerns the extent to which this helping encounter contributed to the recipient's morale or satisfaction. The implication here is that the performance and satisfaction of our recipient would decrease. But should the correlation between performance and satisfaction be necessarily positive?

Before attempting an answer, it would be useful to consider in some detail Sampson's (1969) two-factor theory of status congruence. According to Sampson, the effects of status congruence on performance and satisfaction are mediated by the factors of justice and mastery. Justice can be of two kinds: equity and equality. The notion of equality is borrowed intact from Adams (1965); it signifies that one person's income/output ratio—or as Homans (1961) would have it in his concept of distributive justice, one person's profit/investment ratio—equals the corresponding ratio of his exchange partner. The justice of equality includes the more familiar usage in the equity literature (Komorita & Chertkoff, 1973; Lerner, 1974; Leventhal, 1976; Reis & Gruzen, 1976) of equal outcome distributions regardless of inputs or investments. It also includes a variant of equality, first proposed by Brandon (1965), which calls for costs and rewards to be equally distributed among all persons whenever the situation makes "fairness" difficult to define. Thus, in her study, in which leadership rank (status) "is not expected to be linked with any particular job rank, then leadership should be assigned such that persons who have a low rank on the other dimensions will be compensated by being given more leadership" (Brandon, 1965, p. 286).

We might restate this version of the justice of equality by saying that when strong positive correlations are not perceived to exist among the various status dimensions under consideration, then, assuming at least one status dimension is allocable, justice is served when the summed ranks of each party across the various status dimensions are equal to the corresponding sums of the other parties. Sampson (1969) proposes that equity norms appear more appropriate than equality norms in the marketplace and when the situational emphasis is on competition and individual rather than team performance (see also Cohen, 1974; Lerner, 1974).

From this it would appear that a situation of status congruence may well promote dissatisfaction under relatively noncompetitive conditions that stress teamwork, since the justice of equality is being violated.

Sampson enumerates three forms of mastery over one's environment: power or resource outcome control, cognitive control (stable expectations), and physical (task) mastery. Sampson (1969) assumes, in keeping with the literature on psychological consistency, that there is a preference for single orderings and proposes that this preference is "a mode which may facilitate environmental control and mastery" (p. 258). Multiple orderings make it difficult to know what to expect. Since status congruence, which involves a single ordering, contributes to such mastery, it has a facilitative effect on performance.

Sampson (1969) speculates further that in order for a viable relationship to develop under conditions that favor the justice of equality, it is reasonable to suppose that mastery and justice can operate according to an equilibrium model, that is, inversely, with mastery at any point being achieved at the expense of justice, then swinging the other way. Over time, however, the same level is achieved on both issues. While he views this approach as being in agreement with Bales's (1955) phase equilibrium model under noncompetitive conditions, he departs from Bales in suggesting a coordination model as more appropriate under competitive conditions. Since, under competitive conditions, the justice of equity is more relevant, and since mastery and equity are quite compatible, they can be achieved simultaneously.

Direct evidence of these alternative process models is lacking, but even apart from the lack, there are limitations with Sampson's (1969) two-factor theory of status congruence. First of all, there is at least one experiment (Exline & Ziller, 1959) to which Sampson alludes which is difficult to reconcile with his theory. Exline and Ziller set up all-female discussion triads allegedly to study how group decisions are made on a couple of judgmental tasks. Task ability and relative decision-making power were each experimentally manipulated, thereby creating groups that were either status congruent or status incongruent. Not only were the congruent groups more congenial, but the quality of their group performance was superior. Since their situation could hardly be characterized as having a marketplace character, why should morale not have been adversely affected by status congruence? Perhaps when one status dimension (task ability) is perceived as not only positively correlated with the other status dimension (decision-making power) but as clearly the only genuinely sensible and fair basis for allocating power, that is, for equity rather than equality to prevail, then status congruence should be satisfying.

Contrast their situation with that employed by Kardush (1968), on whose study Sampson (1969) draws heavily to support his theory. All-male triads were composed allegedly to study how the triad conducts two war games against an imaginary enemy. Status-congruent groups were formed by allegedly randomly assigning a graduate student to be captain, an upper-division student to be sergeant, and a freshman to be private. This order was reversed for the status-incongruent groups (e.g., the graduate student was made private). In these war games, the captain's duties were the most difficult and the private's, the least difficult. Half of the triads were also led to expect that each member would continue in his same job for the second game; the remaining triads were told that role assignment *might* be switched, through randomization, for that second game. The status-congruent groups (both those that expected to remain in the same roles as well as those that expected a possible role switching on the second game) showed superior team performance to the status-incongruent groups on the first (and only) game. On the other hand, status congruence and expectation of a possible role switch had an interaction effect on reported satisfaction: Status-congruent triads that expected a switch and status-incongruent triads that expected no switch were more satisfied than the remaining two sets of triads. Since there was no necessary reason why graduate students should be captains, and since the war game was basically a team affair, it is perhaps not surprising that expectation of changing from equity to inequality (which in Brandon's sense meant toward overall status equality) or of continuing under inequity was more satisfying than the other two conditions.

Two other limitations of Sampson's (1969) theory should be mentioned. Sampson does not deal with the issues of differential performance and morale among group members; for example, whether the private might not find it more satisfying to be captain, a matter of preferred status level. Nor does he consider fairly common mixed-motive situations in which the individual participant may opt either for a strategy of equity or of equality, depending on who has the greater initial advantage (Komorita & Chertkoff, 1973) or what audience he is likely to confront (Reis & Gruzen, 1976).

Some of these issues come to a head, and an answer to our original question can be sought by examining that special kind of helping relationship in which one student is directed to tutor a classmate who may resist seeing the tutor as having superior task competency. It is conceivable that both the performance and morale of this tutee would suffer, compared to the tutor's. Granted that a tutoring relationship is teamlike and involves helping, it typically occurs in an academic environment that stresses individual performance evaluation and competition for grades and where the tutor's relative competence and role switching are apt to be salient variables. Thus this situation would appear to be one in which mastery and equity would operate in parallel fashion. From a practi-

cal perspective, these matters need pursuing, since there is essentially no empirical literature in the peer-tutoring area (cf. Gartner, Kohler, & Riessman, 1971) which directly and systematically examines the tutee's performance and morale relative to the tutor's.

Consider a situation in which, following a pretest in a relevant subject matter, half of the class participants are told they will be randomly assigned to the role of tutor, the other half to the role of tutee. In one third of the pairs, the partners learn that the tutor's pretest competency exceeded the tutee's; in the second third, that their competencies were equal; and in the remaining third, that the tutor's competency was less than the tutee's. There are two sessions, each involving tutor training and tutoring followed by posttests and questionnaires. Furthermore, just prior to the second session, the subjects learn whether each partner will continue in the same role or whether they will switch roles.

This paradigm was first pilot tested in a role-playing experiment (Rosen, Powell, & Schubot, Note 1) that, of course, lacked an actual measure of performance and in which the partner, tutor training, and tutoring were purely imaginary. The promising results of that role-playing study led to the development of a theoretical model of which the present in vivo experiment constitutes a direct test.

In point of fact, two models were developed. The first is referred to as the Session 1 model and the second as the change model. The Session 1 model was derived from the following two key assumptions: (a) Being assigned the role of tutor, since it makes one a kind of teacher surrogate, carries more status and is therefore more desirable than being assigned the role of tutee—desirable both with regard to the assigned role's direct (anticipated or experienced) effects on the performance of each party and with regard to the relative satisfaction (anticipated or experienced) it engenders. (b) An equitable role relationship is more desirable than an inequitable one (for extensive conceptual support, see Adams & Freedman, 1976; Walster, Berscheid, & Walster, 1973) in terms of its effects on both performance and satisfaction. Two degrees of inequity are defined: strong inequity, in which a partner of relatively lesser pretest competency is assigned to tutor a partner of relatively greater competency, and weak inequity, in which the tutor's pretest competency equals that of the tutee.

The dimension of tutorial status was translated into two arbitrary ("desirability") values: +1 for being made tutor and −1 for being made tutee. The equity dimension was translated into three values: +1 for equity, 0 for weak inequity, and −1 for strong inequity. The next step involved adding the relevant values across the two dimensions. For example, in the case of the less competent tutor, the value of +1 for being tutor was added to the value of −1 for being in a relationship of strong inequity, yielding a weight of zero (0) for that cell. The entire set of weights is shown in Table 1. Row and column totals of these hypothetical weights are also shown for the matrix. Note that the largest *positive* weight is located in the *greater* competency condition and the largest *negative* weight, in the lesser competency condition.

The change model makes two basic assumptions: (a) The impact (on perform-

Table 1
Hypothetical Weights for Session 1 Model

First role	Tutor's pretest competency relative to tutee's			Total
	Greater	Equal	Less	
Tutor	2.0 (2.1)	1.0 (1.1)	.0 (.1)	3.0
Tutee	.0 (−.1)	−1.0 (−1.1)	−2.0 (−2.1)	−3.0
Total	2.0	.0	−2.0	

Note. The values in parentheses are the adjusted weights used in the analyses. The weights were adjusted to permit inclusion of all cell means into the analyses. In the case of the tutor, each of the three theoretical weights was increased by +.1, while in the case of the tutee, each of the three theoretical weights was decreased by a value of −.1.

ance and satisfaction) of a change in role status is greater than the impact of a continuation in role status. (b) The impact (on performance and satisfaction) of a change in degree of (in)equity in the role relationship is greater than the impact of a continuation of the same degree of (in)equity.

The first assumption is based on the expectation of relatively larger changes in performance and satisfaction following a change in role than following a continuation of role, the direction of change being contingent on whether the change (if any) was to the more desirable role of tutor than to the less desirable role of tutee. The dimension of (change in) tutorial status was translated into the following four theoretical values: +3 for a change from tutee to tutor, +1 for a continuation as tutor, −1 for continuation as tutee, and −3 for a change from tutor to tutee. That an undesirable–desirable sequence is more satisfying than a desirable–desirable sequence (and vice versa) is consonant with similar assumptions made elsewhere (cf. Aronson & Linder, 1965; Sampson, 1969).

The second assumption, which is quite consonant with the central tenets of equity theory (cf. Adams, 1965; Walster et al., 1973), is based on the expectation of relatively larger changes in performance and satisfaction following large changes in degree of equity than of small changes in degree of equity, the direction of change being contingent on whether the change (if any) in equity status was toward greater or lesser equity. The dimension of (change in) equity status was represented by five theoretical values: +2 for the production of strong equity (i.e., when a more competent tutee was made the tutor); +1 for maintenance of strong equity (a more competent tutor remained the tutor); 0 for reversal of weak inequity (an equally competent tutor became the tutee) or for maintenance of weak inequity (an equally competent tutor continued on as tutor); −1 for the maintenance of strong inequity (a less competent tutor continued to be tutor); and −2 for the production of strong inequity (a more competent tutor was made the tutee). Addition of the relevant values across the two dimensions produced the set of theoretical weights shown in Table 2.

The row totals show that the overall weight differences for the first role are considerably smaller than the corresponding differences for the second role. They also show that the total weight for the first-role tutor is more negative than that for the first-role tutee; this anomaly disappears when one notes that the relatively large negative weights are contributed by tutors who became tutees (Row 2) and the relatively large positive weights by tutees who became tutors (Row 3).

Method

Overview

At the time of recruitment, the undergraduate participants were informed truthfully (a) of our intention to investigate the effects of same-class peer tutoring, first at the college level, then at the public school level; (b) that the experiment would involve two future class sessions; and (c) that at the conclusion of this orientation, they would be asked to complete a pretest on materials relevant to the future tutoring. Prior to the first session, the investigator would arrange to have them randomly organized into same-sex tutor–tutee pairs.

Table 2
Hypothetical Weights for Change Model

Role order	Initial tutor's pretest competency relative to initial tutee's			Total
	Greater	Equal	Less	
Tutor–tutor	2.0 (2.1)	1.0 (1.1)	.0 (.1)	3.0
Tutor–tutee	−5.0 (−5.0)	−3.0 (−3.0)	−1.0 (−1.0)	−9.0
Tutee–tutor	1.0 (1.0)	3.0 (3.0)	5.0 (5.0)	9.0
Tutee–tutee	.0 (−.1)	−1.0 (−1.1)	−2.0 (−2.1)	−3.0
Total	−2.0	.0	2.0	

Note. The values in parentheses are the adjusted weights used in the analyses. The weights were adjusted to permit inclusion of all of the cell means into the analyses. In the case of tutor–tutor, each of three theoretical weights was increased by +.1, while in the case of the tutee–tutee, each of the three theoretical weights was decreased by a value of −.1.

At the beginning of Session 1, each participant was informed who his/her partner would be; whether the participant's pretest score was greater, equal to, or less than the future partner's; which role each partner would have for Session 1; and that role assignments for Session 2 would not be determined until just prior to Session 2. A first-impressions questionnaire was then administered which addressed their expectations of future performance and satisfaction.

The prospective tutors were then assembled for about 20 min. of training by research team personnel who used tape-recorded instructions and printed materials. The tutors then sought out their respective partners and proceeded to tutor them for about 30 min. Following the tutoring, a posttest on the materials covered and a second-impressions questionnaire were administered to all participants.

At the outset of the second tutoring session, which occurred several days later, each pair learned whether the roles would be switched. Roles were exchanged in one half of the pairs. Session 2 tutors were then assembled for training on the new material, after which they tutored their partner. A posttest on the new material and a third-impressions questionnaire were administered to all. The participants were fully debriefed, assured again that their test scores would not be factored into their course grades, and that their ratings would be kept in confidence.

Subjects

The subjects were 178 volunteers (48 males and 130 females) enrolled in several sections of undergraduate educational psychology at the University of Georgia. The stringent requirements of having intact pairs for two sessions resulted in substantial attrition: 43 out of 90 intact pairs remained from the initial sample. Because of the attrition, a replication yielding 46 intact pairs was conducted the subsequent academic quarter. Statistical analysis failed to reveal any differential subject loss among the treatment conditions.

Manipulation of Independent Variables

The 25-item pretest was group administered to each class section. The overall distribution of achievement scores ranged from 2 to 16, the mean being 8.20. Within each class, the distribution of scores was trichotomized; pairs were formed within each of the resulting subgroupings such that the within-pairs scores were either equal or unequal. The manipulation of the independent variable, first assigned role, was carried out by randomly assigning the role of tutor to one member of each pair and the role of tutee to the other member. The independent variable, tutor's pretest competency relative to the tutee's, consisted of three levels. Those pairs in which the pretest scores were about equal (the average difference was .21) constituted the equal competency condition. Those pairs in which the pretest score of the tutor was greater than that of the tutee (the average difference was 1.56) were assigned to the tutor-more-competent condition. The remaining pairs in which the pretest score of the tutor was less than (the average difference was 1.33) that of the tutee were assigned to the tutor-less-competent condition.

The manipulation of the independent variable, second assigned role, was implemented by the random assignment of all pairs within each level of the competency factor to either a no-switch or a switch condition. That is, in the no-switch condition, the second assigned roles would be the same as the first assigned roles, while in the switch condition, the partners would exchange roles prior to the second session.

Measurement of Dependent Variables

The first-impressions questionnaire consisted of 7-point rating scales involving validity checks on the competency manipulation, estimates of the goodness of their own and their partner's future performance, estimates of their own and their partner's enjoyment of the forthcoming tutoring experience, and evaluations of their own role (how valuable, important, powerful, and effective the role would be).

Following the first tutoring session, a 20-item achievement test on the materials covered and a second-impressions questionnaire were administered to all. In addition to the items paralleling (except for verb tense) those in the first questionnaire, the second-impressions questionnaire included items dealing with the participant's own and the inferred partner's estimates of felt indebtedness and desire to switch roles.

Following the second tutoring session, a 20-item posttest on the newly covered material was administered to all participants along with a third-impressions questionnaire. This last questionnaire contained items identical to those in the second-impressions questionnaire and some supplementary items intended to measure the prior familiarity and degree of between-sessions social contact of the members within each pair. There were also items concerning their overall impression of peer tutoring as well as their desire to obtain a new partner, were there to be another session. Since no systematic results were obtained on these supplementary items, they are not discussed further.

Results and Discussion

The set of six hypothetical weights generated by the Session 1 model was used to test whether that theoretical model adequately predicted the first-impressions data. The test involved an application of the contrast or comparison method (Hays, 1963; Winer, 1971) to all six treatment means at once, rather than the conventional analysis of variance, although it

was first necessary to employ the analysis of variance procedure in order to extract the mean squared error needed for evaluating the significance of the contrast.[1] Neither a multivariate contrast analysis, that is, a generalization of Hotelling's T^2 (Bargmann, Note 2) on the set of dependent measures, nor the univariate Fs reached the .05 level of significance. It should be stressed that these first-impressions responses preceded any actual training and tutoring.

The set of 12 hypothetical weights generated by the change model was applied to the change score data (third impressions *minus* second). The multivariate test of the model was highly significant, $F(12, 143) = 7.54$, $p < .001$. The test was a priori with regard to the treatment weights but made use of the a posteriori discriminant function to combine the dependent variables. Thus, it is clear from this analysis that the measures of perceived performance and satisfaction function as conceptually interrelated dependent variables.

Inspection in Table 3 of the univariate Fs on the 12 dependent measures that had entered into the multivariate test (the first 12 listed) reveals that 8 of them were significant (in the appropriate direction) at the .05 level or better. The measures of reported own and inferred partner's performance, along with one role evaluation measure, important, contributed the greatest support for the change model. Own enjoyment was the only measure that failed to yield an F of at least 2.00. Perhaps this particular measure of satisfaction is too prey to demand characteristics, that is, one hesitates to tell the experimenter that one is not enjoying oneself; alternatively, it may reflect individual differences in attitude to the literal content of the tutoring experience.

A crude approximation to the question of goodness of fit to the change model can be obtained somewhat more graphically by rank ordering the theoretical weights shown in Table 2, rank ordering the obtained means in the corresponding 12 cells, and computing Spearman's rho between the two rankings. For instance, the cell means obtained for perceived own (post-test) performance reading from left to right and from top to bottom were .50, .19, .85, −.75, −.20, −.33, .70, 1.17, 1.29, .36, .00, and .17. The rho between this series and the corresponding series of theoretical weights is a highly respectable +.87.

Table 3
Univariate Fs from Change Score Contrast Analyses

Dependent measure	$F(1, 165)$	p
1. (Perceived) own posttest performance	36.16	.001
2. Inferred partner's posttest performance[a]	25.16	.001
3. Own enjoyment	<1	*ns*
4. Inferred partner's enjoyment[a]	2.93	.10
5. Important	24.91	.001
6. Valuable	7.65	.01
7. Effective	2.41	*ns*
8. Powerful	4.98	.05
9. Own felt indebtedness[a]	5.89	.025
10. Inferred partner's indebtedness	3.94	.05
11. Own desire to switch[a]	2.03	*ns*
12. Inferred partner's desire to switch	4.04	.05
13. Role evaluation composite (sum 5–8)	16.26	.001
14. (Actual) second posttest *minus* first posttest performance scores	25.76	.001

[a] The original order of the weights was altered to take into account their negative direction.

A univariate contrast analysis was also performed on the composite formed by the a priori summation of the four role evaluation change scores (Items 5–8). This analysis was clearly significant, $F(1, 165) = 16.26$, $p < .001$. The cell means were 1.14, .12, −.02, −3.62, −2.08, −.25, 1.03, 2.69, .58, .14, −1.19, −1.70; the corresponding rho was +.57.

Last but not least, a univariate contrast analysis performed on the measure of

[1] Detailed tables of means, standard deviations, and univariate analyses of variance on first, second, and third impressions, as well as changes in impressions (third minus second), and on posttest performance for Sessions 1 and 2 have been deposited with the National Auxiliary Publications Service. Order Document No. 03031 from ASIS/NAPS, c/o Microfiche Publications, 440 Park Avenue South, New York, New York 10016. Remit in advance $5 for photocopies or $3 for microfiche and make checks payable to Research and Microfilm Publications, Inc.

change in *actual* (posttest) performance was quite significant, $F(1, 165) = 25.76$, $p < .001$. The obtained means were 1.36, 2.44, 2.13, −.54, .69, −.12, 4.35, 4.90, 3.67, 2.36, 4.00, 2.43; the corresponding rho was +.67. It should be emphasized that the participants were given no feedback as to actual performance. Therefore, the fact that the measures of change in perceived own performance and of change in actual posttest performance were similarly affected is surely nontrivial. In this connection, the overall correlation between perceived own performance and actual performance, following the final session, was clearly positive, $r(176) = .37$, $p < .001$.

In sum, the effort to validate the change model was highly successful. The results of the present experiment offer strong support for the ability of this model to predict the patterns of responses which result from changes in role status and degree of (in)equity. Changes in assigned role status, and in the extent to which the assignment is status congruent and therefore equitable in the present context, directly influence both individual performance and satisfaction. Those measures relating to performance, both perceived and actual, were more strongly affected. That assigned role makes a difference in performance is, of course, no longer news: Other authors have often described tutors as benefiting more from the exchange, performance-wise, than tutees (cf. Gartner et al., 1971). What we have not known previously is that role status as well as equity jointly influence the cognitive outcomes of peer tutoring.

It has also been demonstrated, perhaps for the first time, that it is more satisfying to move into the role of tutor than into that of tutee, especially if the role assignment becomes equitable. Worth noting, too, is the contribution of most of the role evaluation measures. Changes in role and equity, besides influencing performance outcomes, may determine the worth that a participant comes to attach to his role.

Why was the Session 1 model relatively ineffective for ordering the first-impressions data? It may well be that the present participants were quite curious, and perhaps apprehensive, about who their actual classroom partner would be, whether they would get along in this particular relationship, what the tutoring would be like, and how well they would perform on the tests. In short, they may have been quite uncertain as to what to expect in the context of a confusing first week of the academic quarter. After the first tutoring experience, however, most of these uncertainties were probably resolved.

Before deriving specific applications from the theoretical models, it would be highly desirable to test whether the model generalizes to different target populations, such as school-age individuals. A related concern is that of the generalizability of the model to situations in which tutoring is conducted over an extended period of time. Efforts are currently under way to accomplish these goals.

The change model presented in this article takes into account two of the major variables encountered in a peer-tutoring situation, namely, differential role and equity assignments. However, this model assumes that the pairing of the partners remains stable over time. Therefore, an additional concern might be whether a change of partners will have the same impact that has been demonstrated by the previously mentioned variables. This is not merely an academic issue. Absenteeism typically necessitates the impromptu reconstituting of work relationships.

Supposing that changing partners does have an impact on peer tutoring, the question then arises as to the optimal combination of partner change, role change, and equity change. If, on the other hand, it was found that changing partners did not influence peer tutoring in a significant way, it may still be desirable to change partners in order to avoid locking a student in a relationship with an unliked peer (cf. Rosenbaum, 1973). If it was decided to hold competency constant within each pair, should roles be periodically changed or would it suffice to change partners, or both? Likewise, if the roles are to be held constant but partners exchanged, should the new pairs be composed of partners of equal or unequal competency? At what

point do additional changes in one or more of these variables lead to diminishing returns?

Consideration must also be given to the transsituational outcomes of peer tutoring. Since the tutee is required to accept help from the tutor, does this result in the tutor making extracurricular demands upon the tutee? If the tutor is initially perceived both by himself and by the tutee as lacking the relevant competency required for his position, might not the acceptance of help by the tutee serve to convince the tutor that he is in fact qualified? Would this result in the initially incompetent tutor viewing his role, perhaps incorrectly, as being legitimate? What implications would such a result have for the tutor's other status relations, both within and outside of the classroom?

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APPENDIX C

Competence and Tutorial Role as Status Variables Affecting Peer-Tutoring Outcomes in Public School Settings

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Abstract

This four-week same-age peer-tutoring experiment, with 107 public-school dyads, cross-validates and extends a college-level study. Underlying theory predicts better performance and satisfaction outcomes from (a) status-congruent versus incongruent relationships, and from (b) being in the tutor rather than tutee role. Pairs were constituted with the tutor having greater (the status-congruent condition), equal, or less math competence than the tutee. Daily tutor training and tutoring culminated in weekly review and assessment of performance and attitudes. After two weeks, partners exchanged roles. Multivariate contrast analyses clearly supported the two change models: Becoming the tutor (tutee) especially under status congruence (incongruence) increased (decreased) perceived own performance and satisfaction. With one model, actual performance was similarly affected.

Competence and Tutorial Role as Status Variables Affecting Peer-Tutoring Outcomes in Public School Settings

In an earlier pair of studies (Rosen, Powell, & Schubot, 1977), we proposed that the status implications of role assignments in that special kind of helping relationship known as same-age peer tutoring carry with them the potential for inviting invidious comparison and felt inequity and, as a consequence, for affecting the relative performance and morale of the tutoring partners. This thesis was investigated with college undergraduates of both sexes (mainly female) who were enrolled in several upper division sections of educational psychology, by means of the following paradigm:

After being pretested on course-related material, half of the volunteering class participants were told they would be randomly assigned to the role of tutor, the other half to the role of tutee. In one-third of the same-sex pairs, the partners learned that the tutor's pretest competence exceeded the tutee's, a strongly equitable or status-congruent arrangement. In another third, the partners learned that their competencies were equal, and in the remaining third that the tutor's competence was less than the tutee's, arrangements of weak and strong inequity (or status incongruence), respectively. Two sessions were conducted, each session involving the sequence of tutor training, tutoring, a posttest administered to everyone on relevant session material, and an attitudinal questionnaire which every participant completed. Just prior to the second session, which was to involve new materials, the participants in half of the pairs learned that the two partners would exchange roles for that second

session, while those in the remaining pairs learned that each partner would continue on in the same role.

Two theoretical models were successfully applied, one dealing with the first session, and the second, more interesting model, with the predicted changes in the outcomes from the first to the second session. One expectation underlying the change model was that relatively greater changes in performance and satisfaction would occur following a change in role than a continuation of role, the direction of change depending on whether the change, if any, was to the more desirable role of tutor than to the less desirable role of tutee. This dimension of (change in) tutorial status was translated into several values, a more positive value being assigned to a change from tutee to tutor than to continuation as tutor, and a more negative value being assigned to a change from tutor to tutee than to continuation as tutee. Evidence that a superordinate role is more satisfying than a subordinate role was found in Kardush's experiment on status congruence (1968). Furthermore, the assumption that an undesirable-to-desirable sequence is more satisfying than a desirable-to-undesirable sequence is consonant with similar assumptions by others (cf. Aronson & Linder, 1965; Sampson, 1969).

The second expectation underlying the change model was derived from equity theory (cf. Adams, 1965; Walster, Berscheid, & Walster, 1973) and related theorizing on status congruence (Sampson, 1969). Namely, larger changes in the performance and satisfaction of both partners would follow from large changes than small changes in degree of equity, the direction of change depending on whether the change, if any, in equity status was toward greater or toward less equity. To represent this dimension of

(change in) equity status, a more positive value was assigned for production than for maintenance of strong equity (i.e., for a more competent tutee becoming tutor than for a more competent tutor continuing to be tutor); a more negative value for production than for maintenance of strong inequity (i.e., for a more competent tutor becoming tutee, than for a less competent tutor continuing on as tutor); and a zero value for the remaining situations, which involved partners of equal competence.

Finally, the relevant values were added across the two dimensions to generate a set of theoretical weights, which meant of course, that the more competent tutee who became tutor received the most positive weight and, the more competent tutor who became tutee, the most negative weight. The 12 weights thus generated were applied to all treatment means at once, the tests involving both a multivariate (Bargmann, Note 1) and a univariate (Hays, 1963; Winer, 1971) application of the method of contrasts. The multivariate contrast was found to be highly significant in the appropriate direction, as were most of the univariate analyses. Changes in perceived performance, actual performance, and role satisfaction were clearly influenced by changes in assigned role status and degree of (in)equity.

Since most proponents of peer tutoring operate in a public school setting, how might such a proponent, who happened to favor same-age peer tutoring, respond to such findings? Let us play the role of devil's advocate and consider more closely the circumstances surrounding those college studies.

One basic question is whether the underlying social psychological variables of equity or status congruence and of status level also have relevance in the public school setting. A partial answer to this is that

young children are clearly responsive to issues of equity (cf. Lerner, 1974), and that countless sociometric studies attest to the pertinence of status level in the school-age peer group. We might counter that academic competence may be of less critical concern as a status variable for the public school student than for the more self-selected undergraduate. A reply to this might stress that being put "in charge," is satisfying per se, and that the public school student is probably aware of the achievement-related criteria that would be appropriate for having someone control someone else in learning a particular academic subject-matter. To this we might counter that in the last analysis, an empirical test of the generalizability of this theorizing was needed, but that in any case the manner in which the college studies were carried out raises some methodological issues that need to be examined from the perspective of external validity.

For example, the college students knew they were to be in a brief experiment, that they could choose not to participate, that they would not learn their scores, and that the scores would not be factored into their course grades. Such a situation might have contributed to the operation of demand characteristics and generated little concern about the consequences of failing to do well. In addition, while the subject matter was course-relevant, it was not embedded in the normal sequence of course preparations, the sample was relatively homogenous with regard to "real" competence, the tutoring relationship was relatively transitory (two sessions), involved comparative strangers, was necessarily confined to partners who were present on each occasion thus resulting in substantial sample shrinkage, and paired classmates whose ages sometimes differed by

as much as eight years (something that does not happen in the public school). The defense might insist that it would be difficult to derive the findings from the operation of demand characteristics, or a lack of concern with doing well, but agree that a proper resolution of this debate called for a conceptual replication, under circumstances that more closely approximated the realities of the public school classroom.

To implement such a conceptual replication in the public school, the previous research design was altered to allow, first of all, for four weeks of daily tutoring, each week to be followed by performance and attitudinal assessments. The second revision was that all students were to exchange roles with their same-sex partners at the beginning of the third week and to continue on in those new roles for the balance of the study. These two design changes permit us to study how the same student responds both to phases of role stability and to role exchange, without locking any given student into a role that he or she might initially regard as undesirable, and to lessen the extent to which the impact of a given role might progressively attenuate over the four weeks. The specific operational changes that were made with respect to the methodological issues raised above (e.g., subject attrition, "report-card" relevance of learning the material, embeddedness of the study in the curriculum sequence, "real" competence, interpersonal acquaintance, and age differences are dealt with later.

Method

Subjects

In the first of these public school studies, 104 sixth-grade students in four classes of mathematics were recruited in the spring of the school

year. Five pairs were lost due to attrition, leaving 47 same-sex pairs who had completed all phases and filled out all instruments. Similarly, for the second study, which was conducted in the Fall of the school year, 134 sixth- and eighth-grade mathematics students were recruited; after attrition, 60 pairs were left for analysis. Thus, sample attrition was relatively more minor than in the college samples. In the interest of comparability, the data of each public school experiment were standardized. ANOVAs performed on the data from both studies yielded no statistically significant main effects of the sample factor; all $\underline{F}$s < 1. The absence of sample main effects also suggests that the possible effects of differential acquaintance (one study having been run early and the other late in the school year) could be discounted. Therefore, the data from both studies were combined and are presented as one set.

In order to accomplish the "relative competence" manipulation, students were stratified so that within each of the eight classrooms, their prior achievement in mathematics reflected high, average, or low competence. Actual prior grades and standardized math achievement scores were used for this purpose.

Within each of the strata, same-sex students were paired such that one-third of the pairs were of similar previous achievement levels, while two-thirds had dissimilar prior achievement levels. The dissimilarity was kept small (i.e., within stratum), so that the disparities would not be unduly upsetting to the participants in those conditions. Within each tutor-tutee pair, one partner was randomly assigned the initial role of tutor, and the other of tutee; thus, within the unequal conditions

half of the pairs had a tutor who was higher achieving than the tutee; while the converse was the case in the remaining half.

The sequence of events in the four-week study proceeded as follows: On the very first day (Monday) each class was introduced by the teacher to the notion of peer tutoring, then each student was given a note naming his(her) partner, their respective roles, and an indication of their relative math competencies to date (namely as having performed "higher than," "about the same as," or "lower than" their partner).

Each Monday, the students were told what their roles would be for the current week. In fact the roles were exchanged only on the third Monday, and the initial relative competence of the partners made salient again by means of notes.

On all but the last day of each week, the 50-minute mathematics period began with 15-20 minutes of tutor training by the research staff on the printed materials specially prepared for that day, while the prospective tutees were drilled in another room on unrelated materials by the classroom teacher. In the remaining 30-35 minutes, the class was reassembled and the tutoring took place. On the last day of each week, the tutors were given review materials to guide their tutees' (and their own) preparation for the weekly test, the results of which were shared with the teacher but not with the student. Following administration of this weekly test to all participants, an attitudinal questionnaire was administered to all, as well. It consisted of Likert-type scales (mostly 6-point) dealing with perceptions of own performance and, in the area of satisfaction, dealing with feelings of enjoyment, importance, usefulness,

being the boss, pride, desire to switch jobs (5-point), and feelings of indebtedness (5-point). We had encountered mixed results in the past with rated enjoyment and rated feelings of indebtedness, perhaps because the measures include too much "semantic noise." For example, in the case of indebtedness, we found some early evidence that it had positive connotations for some participants. Nevertheless, we retained these scales in the interest of replication.

Differences in the procedures of the two public school studies, although they did not produce differences in results, should be noted. First, the endpoints on several of the affective assessment scales were adjusted slightly in the second study to reduce possible floor or ceiling effects. Another change involved using test items from teacher manuals and standardized tests rather than creating test items as had been the case in the first study. Finally, the sixth-grade students in the first study were learning 4th, 5th, or 6th grade materials, whereas the second study included 6th and 8th grade students learning material at their appropriate grade levels. In either case, our materials were based on the same text pages that the teachers were to cover in that four-week period.

Results

Two multivariate contrast analyses were conducted. The first involved the simultaneous application of the 18-weight Phase Change model (see Table 1) to the respective treatment means, while the second involved the corresponding application of the 6-weight Global Change model to the appropriate means.[1] The Phase model test yielded a highly significant

result, $F(9, 346) = 15.57$, $p<.001$. Similarly, the Global Change model test was highly significant, $F(9, 200) = 18.24$, $p<.001$. The univariate Fs for both analyses are cited in Table 3, while the Global Change means are shown in Table 4.

Inspection of the outcomes in the two sets of univariate tests reveals smaller Fs on nearly every measure used in the Phase Change analysis than in the Global Change analysis. This is not too surprising: Although the Phase model provides considerably more degrees of freedom, it imposes a much more exacting set of requirements on the data. Since the Phase Change model calls for least change in Phase 1 and relatively little in Phase 3, real difference scores of small magnitude are likely to be obscured by the greater unreliability that was introduced by using the more discrete (i.e., more circumscribed, temporal units of the) Phase Change approach as opposed to the Global Change approach. This problem would also manifest itself as a greater restriction of range in correlations pertaining to Phase 1 and 3 than Phase 2, and consequently of relatively smaller intercorrelations in Phases 1 and 3. Examination of the within-phase correlation matrices of change scores shows smaller average intercorrelations in both Phase 1 ($\bar{r} = .15$) and Phase 3 ($\bar{r} = .19$) than in Phase 2 ($\bar{r} = .24$). This pattern of differences was more noticeable in the case of the four role evaluation measures (important, useful, being the boss, and proud), the Phase 1 ($\bar{r} = .26$) and Phase 3 ($\bar{r} = .32$) intercorrelations being smaller than the Phase 2 intercorrelations ($\bar{r} = .47$).

On the positive side, inspection of the F values (Table 3) suggests that the relative contributions (in terms of order of magnitude) of the

various dependent variables to each model, respectively, were quite similar.. Thus, the four measures which concerned own role evaluation showed highly significant effects as did the measure of participants' own desire not to switch jobs with the partner. It was not surprising to find again that ratings of own enjoyment and of felt indebtedness (i.e., of owing the partner something), failed to contribute significantly to either model. Both models successfully predicted how participants would evaluate their own test performance. Only the Global model succeeded in predicting actual test performance. It should be noted that the overall changes in actual test performance were significantly correlated with changes in perceived own performance ($\bar{r}$ = .29, $p<.001$), but not with changes, on the average, in satisfaction measures ($\bar{r}$ = .02). On the other hand, changes in perceived performance were significantly associated, on the average, with changes in satisfaction ($\bar{r}$ = .23, $p<.001$).

Turning again to a consideration of the data to which the change models were fitted, it is encouraging to note that the effects of role sequence in all but one measure (felt indebtedness) showed the appropriate "cross-over" between Week 2 and Week 3. That is, tutors who became tutees showed the predicted decrement in performance (perceived and actual) and satisfaction, while the tutees who became tutors showed the predicted increments.

If one were to ignore the predictably poor contributions of the measures of own enjoyment and indebtedness, and to consider instead how well the obtained means ordered themselves on each of the seven remaining measures in accordance with the dictates of the Global Change model, a more graphic view of the highly significant fit of these data to the model can be seen

by simply rank ordering the global obtained means shown in Table 4 and comparing their rankings with the obvious rankings of the Global theoretical weights shown in Table 1. The average rho between the seven obtained orderings and the theoretical ordering is +.93. It is especially noteworthy that the initially more competent tutor who became tutee generally ranked lowest, while the initially more competent tutee who became tutor generally ranked highest, in terms of magnitude and direction of change. The more exacting product-moment $\bar{r}$ between obtained means and theoretical weights is +.80. With regard to the Phase Change model, the product-moment r between the relevant obtained means shown in Table 2 on desire to switch jobs, and the corresponding 18 theoretical weights shown in Table 1, is +.74. Granted that "desire to switch" was one of our best measures, it is also conceptually a critical (inverse) measure of satisfaction.

Discussion

It will be recalled that a change model, which had proven successful for predicting dyadic peer tutoring changes in college-level classmates, was adapted to the public school for purposes of conceptual replication and generalizability. The results obtained in applying these newer models, the relatively elaborate Phase Change model and the more abbreviated Global Change model, to the public school milieu, fully justified our efforts. They indicate that changes in both status level and status equity (status congruence) are important determinants of task- and morale-relevant aspects of the peer tutoring experience.

As predicted, once tutors were made to exchange roles with their tutees, these former tutors exhibited a decline in perceived performance and satisfaction. By way of contrast, their former tutees, now tutors, showed an

increase in those variables. As expected, the decline was especially marked when the former tutor was initially the more competent partner, while the increase was particularly noticeable when the former tutee was initially the more competent of the two.. What makes these results particularly dramatic is that these combinations of status level and status equity exerted their effects even though the tutoring was in a subject matter that probably lacked intrinsic appeal for many of the participants, namely, mathematics. This vindicates our initial supposition that the symbolic value of status may often transcend its perceived instrumental value (i.e., the value of learning math), in the short run, and at least leaves open the possibility, that in the long haul the motivation of the former may "contage" to the latter.

It was also encouraging to find that one of the models (Global Change) did successfully predict actual test performance. While actual test performance and perceived performance were significantly correlated, and while perceived performance and the satisfaction measures were also significantly correlated, no relationship was found between actual performance and satisfaction. This lack of relationship can be attributed, in part, to the fact that no feedback whatever was given during the course of the study. It must be noted again, here, that the manipulation of initial relative competence in mathematics was kept deliberately small, so as not to upset students unduly, and to minimize some of the difficulties that might be encountered in having students tutor fellow students who were much more competent than they. Had the manipulation been stronger, it seems probable that the systematic changes, not only in perceived performance and satisfaction, but also in actual performance, would have been magnified.

On the other hand, since the main thrust of these studies involved a comparison between same-age tutors and tutees, questions of absolute levels of attainment in mathematics through tutoring cannot be addressed through the present designs. Such questions would require the use, not only of such comparison groups as were employed here, but also of control peers who received equal, but more traditional, exposure to the tutoring materials.

One issue that needs to be explored is whether status considerations continue to remain salient for long-term participants in same-age peer tutoring. While the present studies were carried out over a longer period of time than were the college studies, it remains to be seen whether the motivational value of (changes in) status conditions would continue or attenuate, if the tutoring were to continue.

A related issue for which no systematic data exist concerns the effects on both performance and satisfaction of reconstituting each tutoring dyad. In keeping with the present focus on the structural features of peer tutoring, the comparisons of interest are those between dyads that undergo different kinds of changes in one or more of the major parameters, i.e., role change, partner change, and change in the relative initial competence of the new partners from that of the old. For instance, partners and/or roles might be traded. Furthermore, partners of equal (unequal) relative competence might obtain new partners again of equal (unequal) competence, or they might now obtain new partners of unequal (equal) competence, and vice versa. Comparisons among such conditions would provide a partial answer to the question of what form(s) of same-age tutorial pairing is optimal for both performance and morale.

Further light on the issue of optimal pairing might, perhaps, also be cast by investigating whether the type of set under which dyad partners operate affects the differential outcomes of the partners, and the outcomes of the dyad considered as a unit. In the present studies relations within the dyad were probably made salient, an emphasis which may well have contributed to the invidious comparisons, and induced individualistic, if not competitive, orientations. It may well be, however, that such comparisons and orientations would have been attenuated and replaced by a set of promotive interdependence, with beneficial results, if the tutorial partners had been led to believe that the objective was to see how well the dyad performed in competition with other dyads in the classroom, or if each participant were led to believe that he or she was competing with same-role (and/or same-ability) participants in other dyads.

In addition to the induction of such a set (cooperation within-competition between tutoring dyads), it would also be fruitful to investigate the individual and dyadic effects of introducing interim feedback on how well the dyad (or dyadic partner) was performing relative to other dyads (or individuals within other dyads), borrowing some of the interesting features of the "teams-games-tournament approach" employed by others with apparent success (DeVries & Edwards, 1974; DeVries & Slavin, Note 2). It should be noted that the TGT approach typically involved within-team peer-tutoring as a dependent variable, whereas our concern is with peer-tutoring as an independent variable.

Finally, it is suggested that while our focus has been on structural variables, this is not to deny the importance of also investigating

through direct observation, that relatively neglected area of research (Feldman, Devin-Sheehan, & Allen, 1976), the dynamics of peer tutoring interaction process, in order to determine how structural factors such as group composition, and task variables (e.g., subject matter) affect the nature and quality of the tutoring process.

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Footnotes 20

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[1]To account for changes between successive weeks of tutoring, a Phase Change model was constructed. Change in tutorial status is represented, in the tutor-then-tutee sequence, by desirability values of +.5, -3.5, and -1.5, respectively, for the Phase 1 (Week 2 - Week 1) difference of continuing to be tutor, the Phase 2 (Week 3 - Week 2) difference of then becoming tutee, and the Phase 3 (Week 4 - Week 3) difference of then continuing as tutee. Complementary values (-.5, +3.5, +1.5) are used for the tutee-tutor sequence. Change in equity status is represented by values of +1, -3, and -2, respectively, for continuing under strong equity (Phase 1), then changing to strong inequity (Phase 2), then continuing under strong inequity (Phase 3). Complementary values (-1, +3, +2) are used for the opposite sequence. Zero is used in the remaining cases (involving weak inequity). The Phase 3 values in both dimensions reflect some influence (sign-wise) of the Phase 2 values. Summing the dimensional values within each of the 18 pairs of values generated, yields the 18-weight Phase Change model (Table 1). The abbreviated Global Change model, which concerns the difference between

Weeks 3 and 4 combined and Weeks 1 and 2 combined, entails giving values of -4.5 for being tutor then tutee and +4.5 for being tutee then tutor. Concerning equity, values of -4, +4, and 0 are given to represent, respectively, a change from strong equity to strong inequity, strong inequity to strong equity, and all changes involving weak inequity. As above, summation produces the 6-weight Global Change model (Table 1). Each weight is equivalent to the algebraic sum of the three relevant phase weights of the Phase model.

Table 1

Theoretical Weights in Phase and Global Change Models

Role sequence		Initial Tutor's Competence Relative to Tutee's		
	Phase[a]	Greater	Equal	Lesser
Tutor-Tutee	1	+1.5	+0.5	-0.5
	2	-6.5	-3.5	-0.5
	3	-3.5	-1.5	+0.5
	[Global change][b]	-8.5	-4.5	-0.5
	Phase	Greater	Equal	Lesser
Tutee-Tutor	1	+0.5	-0.5	-1.5
	2	+0.5	+3.5	+6.5
	3	-0.5	+1.5	+3.5
	[Global change]	+0.5	+4.5	+8.5

[a]Phase 1 represents the Week 2 - Week 1 difference; Phase 2 represents the Week 3 - Week 2 difference; Phase 3 represents the Week 4 - Week 3 difference.

[b]These global change weights represent the difference between Weeks 3 and 4 combined (Weeks 3 & 4) and Weeks 1 and 2 combined (Weeks 1 & 2), and can be calculated by adding the three relevant phase weights.

Table 2

Means of Standardized Phase Analysis and

Global Change Scores on Desire to Switch Jobs

Role sequence		Initial Tutor's Competence Relative to Tutee's		
	Phase[a]	Greater	Equal	Lesser
	1	-0.08[c]	-0.25	-0.18
Tutor-Tutee	2	-1.27	-0.72	-0.35
	3	+0.02	+0.28	-0.11
	[Global change][b]	-2.39	-1.40	-1.00
	Phase	Greater	Equal	Lesser
	1	+0.26	-0.06	+0.30
Tutee-Tutor	2	+0.63	+0.59	+0.89
	3	-0.27	+0.03	+0.04
	[Global change]	+1.25	+1.16	+2.13

[a]Phase 1 represents the Week 2 - Week 1 difference; Phase 2 represents the Week 3 - Week 2 difference; Phase 3 represents the Week 4 - Week 3 difference.

[b]Global change means represent the difference between the combined scores of the last two weeks (Weeks 3 & 4) and the combined scores of the first two weeks (Weeks 1 & 2).

[c]More positive scores indicate <u>less</u> desire to switch.

Table 3

Univariate Fs from the Multivariate Contrast Analyses for the Global Change and Phase Change Models

Dependent measure	Global Change		Phase Change	
	F(1, 208)	p	F(1, 346)	p
1. (Perceived) own test performance	8.36	.01	5.02	.025
2. Own Enjoyment	<1	NS	1.01	NS
3. Important	36.29	.001	31.29	.001
4. Useful	22.93	.001	18.89	.001
5. The boss	106.81	.001	104.15	.001
6. Proud	23.22	.001	17.07	.001
7. Own desire (not) to switch jobs	72.28	.001	61.93	.001
8. Own felt indebtedness	<1	NS	1.34	NS
9. Actual test performance	4.51	.05	<1	NS

Table 4

Means of Standardized Global Change Scores

(Weeks 3 and 4 combined minus Weeks 1 and 2 combined)

(n=107 pairs)

Dependent measure	Role Sequence	Initial Tutor's Competence Relative to Tutee's: Greater	Equal	Lesser
1. (Perceived) own test performance	RE[a]	-.65	-.46	-.27
	ER	.63	.73	.07
2. Own enjoyment	RE	-.29	.08	-.57
	ER	.69	.17	.03
3. Important	RE	-1.37	-1.08	-.82
	ER	1.53	.70	.93
4. Useful	RE	-1.07	-.52	-.66
	ER	.91	.56	.75
5. The boss	RE	-2.11	-1.66	-1.84
	ER	1.78	1.60	2.16
6. Proud	RE	-1.29	-.24	-.73
	ER	.81	.44	.95
7. Own desire (not) to switch jobs	RE	-2.39	-1.40	-1.00
	ER	1.25	1.16	2.12
8. Own felt indebtedness	RE	.00	-.21	-.24
	ER	-.11	.54	.04
9. Actual test performance	RE	.00	-.56	-.56
	ER	.11	.72	.26

[a]RE = tutor-tutee sequence; ER = tutee-tutor sequence.